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CANADA—DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH

ANNUAL REPORT

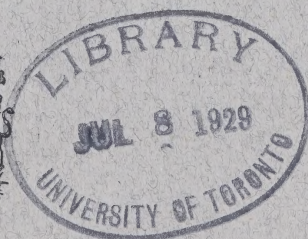
ON THE

MINERAL PRODUCTION OF
CANADA

DURING THE CALENDAR YEAR

1927

Published by Authority of the Hon. James Malcolm, M.P.,
Minister of Trade and Commerce



OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1929

Price, 50 cents

LIST OF PUBLICATIONS

PREPARED IN THE MINING, METALLURGICAL AND CHEMICAL BRANCH DOMINION BUREAU OF STATISTICS

MINERAL PRODUCTION (Mining and Metallurgy).

General Reports—

Preliminary Reports (semi-annual) on the Mineral Production of Canada.

Annual Report on the Mineral Production of Canada. (In one volume).

A comprehensive record of the mining industry embodying historical and world data, detailed information on mineral production, imports and exports for Canada and general statistics relative to the mining industry on capital investment, employment, fuel consumption and power equipment arranged in 11 chapters each dealing with a particular branch of the industry. Statistics on production and trade in mineral products appear in detail in the appropriate chapters. A list of operating companies with their office and plant addresses is included. Fully indexed. Chapter titles are: Canada—The Provinces—The Gold Mining Industry—The Silver Mining Industry—The Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries—Directory of Reporting Firms—Notes on the Methods of Computing Values—Index.

Coal—

Monthly and Quarterly Report on Coal and Coke Statistics for Canada.

A condensed report on production, imports and exports of coal and coke is issued monthly, publication being made about the fifteenth of the next following month.

A more general review is published quarterly, showing statistics for each month for the quarter, and for the year to date on the output by coal-mining districts and by provinces, imports and exports by ports and by kinds of coal, employment in coal-mining, and tonnage lost. There is also a section on coke showing production, imports, exports, distribution and consumption by months and by provincial groups.

Annual Report on Coal Statistics for Canada.

Text and tables showing, for Canada, and for each of the coal-producing provinces, historical and current data on output, tonnage lost, disposition of coal from the mines, domestic and foreign shipment, exports and imports by ports, consumption of coal, prices, employment, salaries and wages paid, power equipment, capital investment, etc.

Bulletins—

(a) PRODUCTION—

Metals.—Arsenic—Cobalt—Copper—Gold—Lead—Nickel—Metals of the Platinum Group—Silver—Zinc—Miscellaneous Metals including Aluminium, Antimony, Chromite, Iron Ore, Manganese, Mercury, Molybdenum, Tin, Tungsten.

Non-Metals.—Abrasives—Asbestos—Coal—Feldspar—Gypsum—Iron Oxides—Mica—Natural Gas—Petroleum—Quartz—Salt—Talc and Soapstone—Miscellaneous Non-Metallic Minerals including Actinolite, Barytes, Fluorspar, Graphite, Magnesite, Magnesium Sulphate, Mineral Waters, Natro-Alunite, Peat, Phosphate, Pyrites, Sodium Carbonate, Sodium Sulphate.

Structural Materials.—Cement—Clay and Clay Products—Lime—Sand and Gravel—Stone and Slate.

(b) MINERAL INDUSTRY—

Each bulletin in this group shows in synopsis, material to be published subsequently as one chapter of the annual report on the mineral production of Canada. These bulletins are published in mimeograph form from time to time during the year as the necessary material becomes available.

By Industries.—Gold Mining Industry including Alluvial Gold, Auriferous Quartz and Copper-Gold-Silver Mining—Silver-Cobalt and Silver-Lead-Zinc Industry—Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries.

By Provinces.—Nova Scotia—New Brunswick—Quebec—Ontario—Manitoba—Saskatchewan—Alberta—British Columbia—Yukon.

SEE INSIDE BACK COVER FOR PUBLICATIONS ON MANUFACTURES BASED CHIEFLY ON MINERALS.

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NOTES ON STATISTICS OF PRODUCTION

In the collection of production data, the Dominion Bureau of Statistics makes a division between primary and secondary production. In the first-named class, there are separate sections for the collection of statistics on (a) **Agricultural Products**, (b) **Furs**, (c) **Fish**, (d) **Forest Products**, (e) **Mineral Products**.

In the second are included (a) **Manufacturing** and (b) **Construction**.

Manufacturing is subdivided into nine groups of industries, producing concerns being classified according to the principal component material of their major products. For example, manufactures of leather goods are classified under "Animal Products"; the pulp and paper industry under "Wood and Paper," etc. An outline of the scheme of classification in use for manufacturing industries is given below:—

Manufactures of:

- (1) **Vegetable Products**, including—Coffee and Spices; Cocoa and Chocolate; Preserved and Canned Products; Pickles, Vinegar and Cider; Flour and Cereals; Bread and other Bakery Products; Macaroni and Vermicelli; Distilled and Brewed Liquors and Wines; Rubber Products; Starch and Glucose; Sugar; Tobacco Products; Linseed Oil and Oil Cake.
- (2) **Animal Products**, including—Fish and Fish Products; Dairy Factory Products; Meat and Meat Products; Leather and Leather Products; Furs and Fur Products.
- (3) **Textiles and Textile Products**, including—Cotton Textiles (Cloth, Yarn, Thread and Waste); Woollen Textiles (Cloth, Yarn, Blankets, Felt and Waste); Silk Products; Factory-Made Clothing, Carpets, Rugs and Mats; Cordage, Rope and Twine.
- (4) **Wood and Paper**, including—Pulp and Paper Mill Products; Paper Goods; Printing, Publishing and Lithographing; Saw and Planing Mill Products; Furniture, Carriages, Wagons and Sleighs; Wooden Containers; Woodenware; Turned Wood Products; and the Output of Similar Wood-Using Industries.
- (5) **Iron and Steel and their Products**, including—Pig Iron and Ferro-Alloys; Steel and Rolled Products; Castings and Forgings; Boilers, Tanks and Engines; Agricultural Implements; Machinery; Automobiles; Auto Parts and Accessories; Bicycles; Railway Rolling Stock; Wire and Wire Goods; Sheet Metal Products; Hardware and Tools; Miscellaneous Iron and Steel Products.
- (6) **Manufacture of Non-Ferrous Metals**, including—Aluminium Products; Brass and Copper Products; Lead, Tin and Zinc Products; Precious Metal Products; Electrical Apparatus and Supplies; Miscellaneous Non-Ferrous Metal Products; Non-Ferrous Smelting and Refining.
- (7) **Manufactures of the Non-Metallic Minerals**, including—Aerated Waters; Asbestos and Allied Products; Cement; Cement Products; Coke and By-Products; Gas, Illuminating and Fuel; Glass (blown, cut, ornamental, etc.); Lime; Petroleum Products; Products from Domestic Clays; Products from Imported Clays; Salt; Sand-Lime Brick; Stone, Monumental and Ornamental; Miscellaneous Non-Metallic Mineral Products, including (a) Artificial Abrasives, (b) Abrasive Products, (c) Artificial Graphite and Electrodes, (d) Gypsum Products, (e) Mica Products, (f) Miscellaneous Non-Metallic Mineral Products, n.e.s.
- (8) **Chemicals and Allied Products**, including—Coal Tar and its Products; Acids, Alkalies, Salts and Compressed Gases; Explosives, Ammunition, Fireworks and Matches; Fertilizers; Medicinal and Pharmaceutical Preparations; Paints, Pigments and Varnishes; Soaps, Washing Compounds and Toilet Preparations; Inks, Dyes, and Colours; Wood Distillates and Extracts; Miscellaneous Chemical Products including (a) Adhesives, (b) Baking Powder, (c) Foiler Compounds, (d) Celluloid Products, (e) Flavouring Extracts, (f) Insecticides, (g) Polishes and Dressings, (h) Sweeping Compounds, (i) Chemical Products n.e.s.
- (9) **Miscellaneous Products**, including—Brooms and Brushes; Electric Light and Power; Musical Instruments, etc.

The statistics of manufactures are also classified according to the **use or purpose** of the end product as follows:—

- (1) **Food**, including—Breadstuffs; Fish; Nuts; Fruits and Vegetables; Meats; Milk Products; Oils and Fats; Sugar; Infusions; Miscellaneous.
- (2) **Drink and Tobacco**, including—Beverages, alcoholic; Beverages, non-alcoholic; Tobacco.
- (3) **Clothing**, including—Boots and Shoes; Fur Goods; Garments and Personal Furnishings; Gloves and Mitts; Hats and Caps; Knitted Goods; Waterproofs; Miscellaneous.
- (4) **Personal Utilities**, including—Jewellery and Time-Pieces; Recreational Supplies; Personal Utilities, n.e.s.
- (5) **House Furnishings**.
- (6) **Books and Stationery**.
- (7) **Vehicles and Vessels**.
- (8) **Producers' Materials**, including—Farm Materials; Manufacturers' Materials; Building Materials; General Materials.
- (9) **Industrial Equipment**, including—Farming Equipment; Manufacturing Equipment; Trading Equipment; Service Equipment; Light, Heat and Power Equipment; General Equipment.
- (10) **Miscellaneous**.

PREFACE

In the present report, the format adopted in the report for 1926 has been followed closely, the arrangement by chapters having been found to be a marked improvement over the previous division between production data and general statistics.

A revised list of the concerns operating in the mining industry has been included so that the names and addresses of the reporting companies may be readily available for reference.

Statistical reports on the mineral production of Canada issued by the Dominion Bureau of Statistics include the following publications: (a) Preliminary estimate of production issued on January 1 of each year; (b) Preliminary Report for the calendar year, printed in February; (c) Report on production during the six months ending June 30, distributed in August; (d) Bulletins giving finally revised production data for the calendar year on each mineral product, issued as the compilations are completed; (e) Annual Report on the Mineral Production of Canada, available towards the close of the year. Monthly bulletins on Coal and Coke Statistics are issued on the fifteenth of each month and these are supplemented by quarterly reports containing revised and more detailed information and a special annual report, published in June, which gives complete information on the Canadian coal mining industry and on the importation and distribution of coal in Canada, during the next preceding year.

The cordial thanks of the Bureau are tendered to the Dominion Department of Mines and to the several Provincial Departments of Mines, which have without exception, assisted materially in the preparation of the report. In reference to the co-ordination of mining statistics between the Provincial Departments and this Bureau, it has been found possible to arrange for the co-operative collection of monthly statistics of coal production with all the provinces in which such records are obtained, namely Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia. In the field of general mining statistics, co-operative arrangements with the Ontario, Quebec and British Columbia Departments of Mines have been continued, thus preventing overlapping and duplication of work. All data collected by the Bureau on mining statistics are made available to the Dominion Department of Mines.

The thanks of the Bureau are also tendered to the mine and smelter operators, for assistance given and information made available. The railway and other transportation companies, as well as smelter operators outside of Canada, have also furnished data, the receipt of which is gratefully acknowledged.

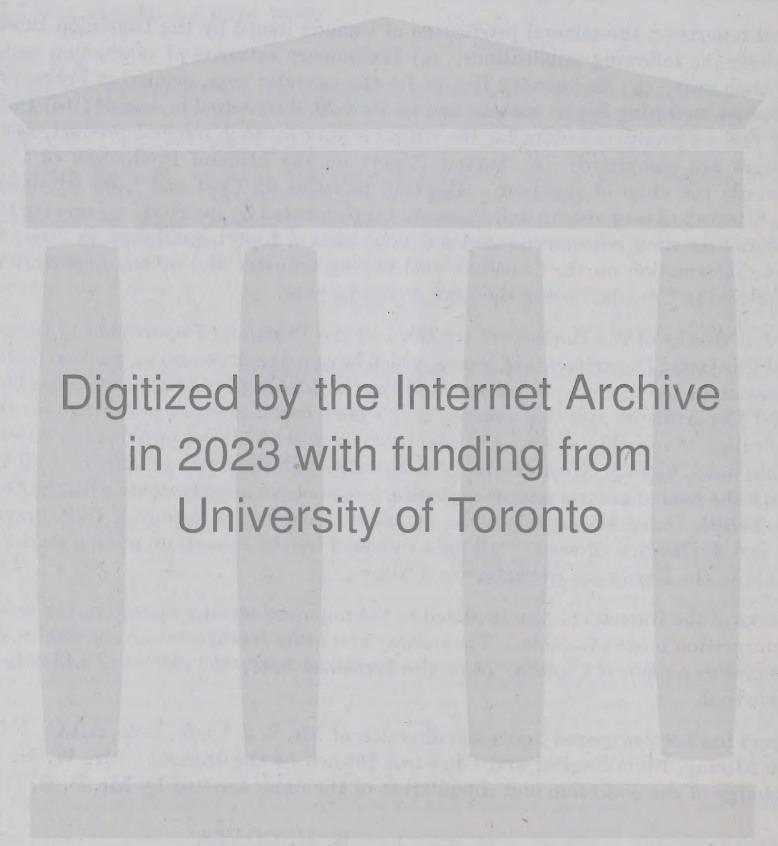
The report has been prepared under the direction of Mr. S. J. Cook, B.A., A.I.C., F.C.I.C. Chief of the Mining, Metallurgical and Chemical Branch of the Bureau. Mr. W. H. Losee, B.Sc., had charge of the collection and compilation of the data, assisted by Mr. B. R. Hayden.

R. H. COATS,

Dominion Statistician.

DOMINION BUREAU OF STATISTICS, OTTAWA,

January 19, 1929.



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Table 1.—Quantities and Values of Mineral Products from Canadian Sources 1926 and 1927

			1926			1927			
			Quantity	Value	Per cent of total	Quantity	Value	Per cent of total	
METALLICS				\$			\$		
Antimony.....	lb.		1,596	281					
Arsenic (As ² O ³).....	lb.		5,074,677	146,811	0-06	6,227,968	211,979	0-08	
Bismuth.....	lb.		6,440	6,440		2,072	1,003		
Cobalt.....	lb.		664,778	1,136,014	0-48	880,590	1,764,534	0-71	
Copper.....	lb.		133,094,942	17,490,300	7-29	140,147,440	17,195,487	6-95	
Gold.....	fine oz.		1,754,228	36,263,110	15-06	1,852,785	38,300,464	15-49	
Iron ore sold for export.....	tons		200	600		2,029	8,980		
Lead.....	lb.		283,801,265	19,240,661	7-99	311,423,161	16,477,139	6-67	
Molybdenite.....	lb.		20,943	10,472					
Nickel.....	lb.		65,714,294	14,374,163	5-99	66,798,717	15,262,171	6-17	
Palladium, Rhodium, Iridium, etc.....	fine oz.		10,024	640,178	0-27	11,545	554,190	0-22	
Platinum.....	fine oz.		9,521	923,607	0-39	11,228	717,613	0-29	
Silver.....	fine oz.		22,371,924	13,894,531	5-77	22,736,698	12,816,677	5-18	
Zinc.....	lb.		149,938,105	11,110,413	4-63	165,495,525	10,250,793	4-14	
Total.....				115,237,581	47-93		113,561,030	45-90	
NON-METALLICS									
Fuels									
Coal.....	tons		16,478,131	59,875,094	24-88	17,426,861	61,867,463	25-01	
Natural gas.....	M cu. ft.		19,208,209	7,557,174	3-16	21,376,791	8,043,010	3-26	
Petroleum, crude.....	brls.		364,444	1,311,665	0-56	476,591	1,516,043	0-60	
Total.....				68,743,933	28-60		71,426,516	28-87	
Other Non-Metallics									
Actinolite.....	tons		80	1,000		86	1,075		
Asbestos.....	tons		279,403	10,099,423	4-16	274,778	10,621,013	4-30	
Barytes.....	tons		100	2,307		56	1,268		
Bituminous sands.....	tons		528	2,112		2,706	10,824		
Diatomite.....	tons					266	6,650		
Feldspar.....	tons		35,951	310,238	0-14	29,849	259,151	0-10	
Garnets.....	tons					2	150		
Graphite.....	tons		2,727	194,860	0-08	1,829	111,656	0-04	
Grinding pebbles.....	tons		64	576					
Grindstones.....	tons		2,695	151,227	0-06	2,251	125,017	0-05	
Gypsum.....	tons		883,728	2,770,813	1-15	1,063,117	3,251,015	1-32	
Iron oxides.....	tons		6,626	101,843	0-05	6,125	103,536	0-04	
Magnesite.....	tons		4,571	137,431	0-07	7,337	230,309	0-09	
Mica.....	tons		2,545	229,204	0-09	2,738	174,377	0-08	
Mineral water.....	gals.		215,356	29,721	0-01	303,530	14,624		
Natro-alunite.....	tons					7	248		
Phosphate.....	tons		40	800		151	1,717		
Pyrites.....	tons		17,845	63,899	0-02	50,863	198,388	0-08	
Quartz.....	tons		232,082	553,161	0-24	233,984	496,364	0-21	
Salt.....	tons		262,547	1,480,149	0-63	268,672	1,614,667	0-66	
Silica brick.....	M		2,665	130,702	0-05	1,791	79,527	0-03	
Sodium carbonate.....	tons		595	5,370		805	9,995		
Sodium sulphate.....	tons		6,775	13,550		5,659	11,319		
Talc and soapstone.....	tons		15,767	217,195	0-09	16,521	236,105	0-09	
Volcanic dust.....	tons		90	630		105	735		
Total.....				16,496,211	6-84		17,559,730	7-09	
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS									
Clay Products									
Brick—Soft mud process.....	Face.....	M	28,235	556,573	0-24	16,196	325,966	0-13	
	Common.....	M	78,158	1,145,490	0-49	70,554	1,091,274	0-44	
Stiff mud process.....	Face.....	M	101,028	2,146,362	0-89	95,480	2,024,064	0-81	
	(wire cut).....	Common.....	M	94,046	1,624,055	0-68	150,222	2,239,180	0-90
Dry press.....	Face.....	M	30,423	651,236	0-28	39,753	833,570	0-33	
	Common.....	M	19,450	260,598	0-10	14,617	187,062	0-07	
Fancy or ornamental brick.....		M	462	24,057	0-01	620	29,372	0-01	
Sewer brick.....		M	6,546	117,194	0-05	10,997	210,643	0-08	
Paving brick.....		M	122	5,015		50	2,106		
Firebrick.....		M	4,195	192,276	0-08	5,388	246,266	0-09	
Fire clay and other clay.....	tons		2,513	23,258	0-01	5,070	35,961	0-01	
Kaolin.....	tons					24	120		
Fire clay blocks and shapes.....				54,064	0-02		100,659	0-05	
Hollow blocks.....	tons		141,909	1,313,707	0-55	151,307	1,431,141	0-58	
Roofing tile.....	No.		17,018	1,562		2,000	140		
Floor tile (quarries).....	sq. ft.		195,011	43,854	0-02	135,285	32,559	0-01	
Ceramic or glazed floor and wall tile.....				943					
Drain tile.....	M		14,258	396,018	0-16	22,259	598,098	0-25	
Sewer pipe, copings, flue linings, etc.....	tons		75,996	1,480,776	0-61	77,262	1,475,875	0-60	
Pottery, glazed or unglazed.....				320,135	0-13		307,057	0-15	
Bentonite.....	tons		30	150					
Other clay products.....							2,076		
Total.....				10,357,323	4-32		11,173,189	4-51	
Other Structural Materials									
Cement.....	brl.		8,707,021	13,013,283	5-42	10,065,865	14,391,937	5-82	
Lime.....	bush		11,825,736	3,781,484	1-57	12,707,221	3,923,388	1-58	
Sand and gravel.....	tons		17,112,798	4,941,434	2-06	22,952,819	6,055,601	2-45	
Stone—									
Granite.....	tons		1,064,423	1,574,627	0-65	730,049	1,383,557	0-56	
Limestone.....	tons		5,283,745	5,657,328	2-35	6,438,379	7,145,917	2-89	
Marble.....	tons		5,295	521,572	0-22	5,209	503,037	0-23	
Sandstone.....	tons		44,127	112,347	0-04	132,799	232,793	0-10	
Total.....				29,602,075	12-31		33,636,230	13-63	
Grand total.....				240,437,123	100-00		247,356,695	100-00	

Table 2.—Increase or Decrease in Quantities and Values of Mineral Products from Canadian Sources in 1927 as Compared with 1926

		Increase (+) or Decrease (—)		Increase (+) or Decrease (—)	
		Quantity	%	Value	%
METALLICS					
Antimony.....	lb.	—	1,596	—	\$ 281
Arsenic.....	lb.	+	1,153,791	+	65,168
Bismuth.....	lb.	—	4,368	—	5,437
Cobalt.....	lb.	+	215,802	+	628,520
Copper.....	lb.	+	7,052,498	+	294,813
Gold.....	fine oz.	+	98,557	+	2,037,354
Iron ore sold for export.....	tons	+	1,829	+	8,380
Lead.....	lb.	+	27,621,896	+	2,763,522
Molybdenite.....	lb.	—	20,943	—	10,472
Nickel.....	lb.	+	1,084,423	+	888,008
Palladium, Rhodium, etc.....	fine oz.	+	1,521	+	85,988
Platinum.....	fine oz.	+	1,707	+	205,994
Silver.....	fine oz.	+	364,774	+	1,077,854
Zinc.....	lb.	+	15,557,420	+	859,620
Total.....				—	1,676,551
NON-METALLICS					
Fuels					
Coal.....	tons	+	948,730	+	1,992,369
Natural gas.....	M cu. ft.	+	2,168,582	+	485,836
Petroleum.....	brl.	+	112,147	+	204,378
Total.....				+	2,682,583
Other Non-Metallics					
Actinolite.....	tons	+	6	+	75
Asbestos.....	tons	—	4,625	—	521,590
Barytes.....	tons	—	44	—	1,039
Bituminous sands.....	tons	+	2,178	+	8,712
Diatomite.....	tons	+	266	+	6,650
Feldspar.....	tons	+	6,102	—	51,087
Garnets.....	tons	+	2	+	150
Graphite.....	tons	—	898	—	83,204
Grinding pebbles.....	tons	—	64	—	576
Grindstones.....	tons	—	444	—	26,210
Gypsum.....	tons	+	179,389	+	480,202
Iron oxides.....	tons	—	501	—	1,693
Magnesite.....	tons	+	2,766	+	92,878
Mica.....	tons	+	193	+	54,827
Mineral water.....	Imp. gal.	+	88,174	—	15,097
Natro-alumite.....	tons	+	7	+	248
Phosphate.....	tons	+	111	+	917
Pyrites.....	tons	+	33,018	+	134,489
Quartz.....	tons	+	1,902	—	56,797
Salt.....	tons	+	6,125	+	134,518
Silica brick.....	M	—	874	—	51,175
Sodium carbonate.....	tons	+	210	+	4,625
Sodium sulphate.....	tons	+	1,116	—	2,231
Talc and soapstone.....	tons	+	754	+	18,910
Volcanic dust.....	tons	+	15	+	105
Total.....				+	1,063,519
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS					
Clay Products					
Brick—Soft mud process—{Face.....	M	—	12,471	—	230,607
{Common.....	M	—	11,801	—	54,216
Stiff mud process (wire cut)—{Face.....	M	—	5,548	—	122,298
{Common.....	M	+	56,176	+	615,125
Dry press—{Face.....	M	+	9,330	+	182,334
{Common.....	M	+	4,833	—	73,536
Fancy or ornamental brick.....	M	+	158	+	5,315
Sewer brick.....	M	+	4,451	+	93,449
Paving brick.....	M	—	72	—	2,909
Firebrick.....	M	+	1,193	+	53,990
Fireclay and other clay.....	tons	+	2,557	+	12,703
Kaolin.....	tons	+	24	—	120
Fireclay blocks and shapes.....	\$	—	—	—	46,595
Hollow blocks.....	tons	+	9,398	+	117,434
Roofing tile.....	No.	—	15,018	—	1,422
Floor tiles (quarries).....	sq. ft.	—	59,726	—	11,295
Ceramic or glazed floor and wall tile.....	sq. ft.	—	—	—	943
Drain tile.....	M	+	8,001	+	202,080
Sewer pipe, copings, flue linings, etc.....	tons	+	1,266	+	4,901
Pottery, glazed or unglazed.....	\$	—	—	—	13,078
Bentonite.....	tons	—	30	—	150
Other clay products.....	\$	—	—	—	2,076
Total.....				+	815,866
Other Structural Materials					
Cement.....	brls.	+	1,358,844	+	1,378,654
Lime.....	bush.	+	881,485	+	141,904
Sand and gravel.....	tons	+	5,840,021	+	1,114,167
Stone—					
Granite.....	tons	—	334,374	—	191,070
Limestone.....	tons	+	1,154,634	+	1,488,589
Marble.....	tons	—	86	—	18,535
Sandstone.....	tons	+	88,672	+	120,446
Total.....				+	4,034,155
Grand total.....				+	6,919,572

Table 3.—Mineral Production in Canada by Provinces, 1927

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
METALLICS									
Arsenic..... lb.	35,000			4,961,178				1,231,790	
\$	700			197,668				13,611	
Bismuth..... lb.				2,027					
\$				1,003					
Cobalt..... lb.				880,590					
\$				1,764,534					
Copper..... lb.			3,119,848	45,341,265				91,686,297	
\$			403,084	4,946,533				11,845,870	
Gold..... fine oz.	3,151		8,331	1,627,050	182		42	183,094	30,935
\$	65,137		172,217	33,634,108	3,762		868	3,784,889	639,483
Iron ore sold for export..... tons			2,029						
\$			8,980						
Lead..... lb.			6,496,577	7,990,706				292,770,544	4,165,331
\$			341,461	528,729				15,388,020	218,929
Nickel..... lb.			—	66,798,717					
\$				15,262,171					
Palladium, Rhodium, etc..... fine oz.				11,545					
\$				554,190					
Platinum..... fine oz.				11,217				11	
\$				716,653				960	
Silver..... fine oz.	125		740,864	9,307,953	12		4	11,040,445	1,647,295
\$	70		417,625	5,246,893	7		3	6,223,499	928,580
Zinc..... lb.			17,189,046					148,306,479	
\$			1,064,650					9,186,103	
Total..... \$	65,907		2,408,057	61,852,482	3,769		871	46,442,952	1,786,992
NON-METALLICS									
<i>Fuels</i>									
Coal..... tons	7,071,876	203,950				470,216	6,934,162	2,746,243	414
\$	27,194,671	885,038				868,867	21,982,058	10,934,777	2,052
Natural gas..... M cu. ft.		630,755		7,311,215	200		13,434,621		
\$		124,637		4,331,780	60		3,586,533		
Petroleum, crude..... bbl.		18,244		139,606			318,741		
\$		41,748		288,347			1,185,948		
Total..... \$	27,194,671	1,051,423		4,620,127	60	868,867	26,754,539	10,934,777	2,052
<i>Other Non-Metallics</i>									
Actinolite..... tons				86					
\$				1,075					
Asbestos..... tons			274,778						
\$			10,621,013						
Barytes..... tons	56								
\$	1,268								
Bituminous sands..... tons							2,706		
\$							10,824		
Diatomite..... tons	266								
\$	6,650								
Feldspar..... tons			12,730	17,116					
\$			104,618	154,533					
Garnets..... tons			150						
\$			34	1,795					
Graphite..... tons			2,043	109,613					
\$									
Grindstones..... tons	11	1,860						380	
\$	220	97,197						27,600	
Gypsum..... tons	829,438	85,293		83,098	39,895			24,493	
\$	1,512,015	524,550		500,688	512,008			201,754	
Iron oxides..... tons			5,931					194	
\$			102,186					1,350	
Magnesite..... tons			7,337						
\$			230,309						
Mica..... tons			1,454	1,284					
\$			99,194	75,183					
Mineral water imp. gals			10,330	293,200					
\$			1,813	12,811					
Natro-alunite..... tons								7	
\$								248	
Phosphate..... tons			31	82				38	
\$			399	824				494	
Pyrites..... tons			13,021	463				37,376	
\$			42,795	6,077				149,516	
Quartz..... tons	4,834		49,141	159,150				20,859	
\$	16,721		132,615	266,204				80,824	
Salt..... tons	14,391			254,181			100		
\$	102,590			1,510,777			1,300		
Silica brick..... M	1,238			553					
\$	50,978			28,549					

Table 3.—Mineral Production in Canada by Provinces 1927—Concluded

	Nova Scotia	New Brunswick	Quebec	Ontario	Mani- toba	Saskat- chewan	Alberta	British Columbia	Yukon
<i>Other Non-Metallics</i> —Concluded									
Sodium carbonate, tons								805	
\$								9,995	
Sodium sulphate, tons						5,659			
\$						11,319			
Talc and soapstone, tons			1,276	15,178				107	
\$			51,504	181,981				2,620	
Volcanic dust, tons						105			
\$						735			
Total	1,690,442	621,747	11,388,639	2,848,315	512,008	12,054	12,124	474,401	
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>									
<i>Clay Products</i>									
Brick—									
Soft mud process—									
Face, M	35		83	16,078					
\$	735		1,242	323,988					
Common, M	972	2,885	6,167	44,882	1,132	863	2,305	11,348	
\$	12,893	44,100	63,353	740,664	18,100	10,592	28,461	173,111	
Stiff mud process (wire cut)—									
Face, M	1,345		24,762	65,894	143	1,419	1,545	372	
\$	31,068		577,348	1,321,604	3,800	42,711	35,613	11,920	
Common, M	3,887		106,341	21,177	7,391	5,709	5,619	98	
\$	47,549		1,627,330	310,344	122,019	66,654	62,892	2,392	
Dry press—									
Face, M			2,134	32,695	947	576	2,448	949	
\$			63,047	641,903	21,921	19,197	48,467	39,035	
Common, M				1,147			13,470		
\$				12,716			174,346		
Fancy or orna- mental brick, M			101	519					
\$			4,356	25,016					
Sewer brick, M				10,760				237	
\$				202,920				7,723	
Paving brick, M								50	
\$								2,106	
Firebrick, M	227	40				693	107	4,321	
\$	14,050	2,216				37,085	5,850	187,065	
Fireclay and other clay, tons	2,688	53				1,008		1,321	
\$	8,986	2,112				7,531		17,332	
Kaolin, tons			24						
\$			120						
Fireclay blocks and shapes, \$	525					61,634		38,500	
Hollow blocks, tons	8,793		25,034	86,690	1,552	6,500	15,345	7,393	
\$	96,260		257,558	775,806	18,862	65,000	142,156	75,499	
Roofing tile, No.				2,000					
\$				140					
Floor tiles (quarries), sq.ft.				134,910				375	
\$				32,490				69	
Drain tile, M	53		323	20,330	343	25	157	1,028	
\$	1,610		13,336	521,957	16,762	800	8,992	34,641	
Sewer pipe, copings, flue linings, etc., tons	10,501		5,286	50,828			7,852	2,795	
\$	202,741		126,035	852,187			205,581	89,331	
Pottery, glazed or unglazed, \$		38,757		91,300			177,000		
Other clay products, \$			1,012					1,064	
Total	416,417	87,185	2,734,738	5,853,635	201,464	311,204	889,358	679,788	
<i>Other Structural Materials</i>									
Cement, brl.			4,636,751	3,751,786	551,698		601,699	523,931	
\$			5,383,058	5,144,326	1,378,121		1,303,880	1,182,552	
Lime, bush.	873,200	343,111	3,075,819	6,946,630	648,975		130,596	688,890	
\$	100,254	148,321	806,665	2,198,239	246,279		46,947	376,683	
Sand and gravel, tons	812,976	388,066	8,615,738	7,512,763	1,333,580	1,517,801	1,392,752	1,379,143	
\$	522,723	118,768	1,880,931	2,405,729	228,655	263,100	293,674	342,021	
Stone, tons	72,451	29,908	2,534,531	4,254,960	154,666		3,367	256,553	
\$	120,807	121,091	4,268,315	4,060,709	318,556		7,830	367,996	
Total	743,784	388,180	12,338,969	13,809,003	2,171,611	263,100	1,652,331	2,269,252	
Grand total	\$ 30,111,221	\$ 2,148,535	\$ 28,870,493	\$ 89,982,962	\$ 2,888,912	\$ 1,455,225	\$ 29,309,223	\$ 60,801,170	\$ 1,789,044

DOMINION BUREAU OF STATISTICS

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ANNUAL REPORT ON THE MINERAL PRODUCTION OF CANADA DURING THE CALENDAR YEAR 1927

CHAPTER ONE

GENERAL REVIEW.—A new high record for mineral production in Canada was set in 1927, when the value of the output reached \$247,356,695 marking a gain of \$6·91 million or 2·8 per cent over the previous year's record total of \$240,437,123.

Continuing the notable progress that was a feature of the mining industry in Canada throughout 1926, further advances were made in 1927 in various fields. New output records for all time were established in gold, copper, lead and zinc among the metals, and in coal, cement, lime and gypsum in the non-metal and structural materials field. Values for natural gas and petroleum production also exceeded any recorded in previous years. Increased outputs in comparison with the totals for 1926, were noted in the figures for arsenic, cobalt, copper, gold, lead, nickel, platinum metals, silver, zinc, coal, natural gas, petroleum, gypsum, magnesite, pyrites, salt, talc and soapstone, clay products, cement, lime, limestone, sandstone and sand and gravel.

Metals as a group at \$113,561,030 showed a loss in aggregate value in comparison with the total of \$115,237,581 for 1926, due to the lower prices for copper, lead, zinc and silver that prevailed throughout the year. Increases in the outputs noted above were not sufficient to offset the losses in values due to lower prices.

Fuels showed a general advance. Production values totalled \$71,426,516 for coal, gas and petroleum in 1927 as against \$68,743,933 in 1926.

Other non-metallic minerals including more than a score of different commodities, valued at \$17,559,730 in 1927, also reached a higher aggregate than in 1926. Among the more important members of this group, there may be mentioned asbestos, gypsum, salt, quartz (and silica brick), feldspar, mica, talc and soapstone, magnesite, pyrites, grindstones and graphite.

At \$44,809,419, the clay products, bricks, tiles, etc., and other structural materials, produced during the year attained a total value in excess of the figures for any previous year. In this field the gain in the output of cement was the most outstanding feature. Building permits issued in 63 cities of Canada during the year, to a value of \$184,613,742, showed an advance of 18·3 per cent over the total of \$156,386,607 for the preceding year.

Canada's mineral industry dates back to the eighteenth century and is associated with the explorations of the early adventurers who came to establish a French colony in America. In 1604, Master Simon, a mining engineer who accompanied the celebrated explorer Champlain from France on an expedition under de Monts, discovered iron and silver in St. Mary's bay and copper at Cape d'Or, Nova Scotia. Champlain surveyed Cape Breton island in 1607 but made no note of the coal seams that were easily visible in the cliffs. The first written reference to coal in Nova Scotia was by Nicolas Denys in his description and natural history of Acadia published in Paris in 1672. This in fact was the first mention of coal on the North American continent.

During the year 1730 metallurgical operations were carried on along the north shore of the St. Lawrence river between Montreal and Quebec and bog iron ore was smelted on the St. Maurice river. The St. Maurice forges continued to operate until 1880.

As explorers moved westward other discoveries were made, one of the most interesting being the location of a deposit of argentiferous galena on lake Timiskaming less than ten miles from the present Cobalt camp.

During the years 1843-1863 iron ore was mined in Ontario, copper ore was produced in Quebec, alluvial gold was recovered from the gravels of the St. Maurice river, and lode mining of gold was carried on in Nova Scotia.

Little or no record is available of mineral discoveries in western Canada until the middle of the nineteenth century. Among the first of these was the finding of coal at Fort Rupert in 1835 and then in 1858 placer gold was reported along the Fraser and other rivers in British Columbia. These finds, and subsequent discoveries of copper-gold ores and silver-lead ores, put British Columbia in the van of the Canadian mineral-producing provinces, a position this province maintained, except in the years 1899 and 1900, when placer gold production from the Yukon Territory was at its height, which position it held until 1907 when Ontario assumed the leadership it still enjoys.

Construction of the Canadian Pacific Railway across the continent which was completed in 1885, opened up new districts for the prospector. It was in 1883 that, in the course of blasting a cutting for the railway near Sudbury, Ontario, workers discovered the nickel-copper ore for which this area is now world-famed. Railway construction through the boundary district of British Columbia assisted in the development of the copper-gold and silver-lead-zinc deposits of that area and also of the coal beds of the Crowsnest Pass.

In 1903 when the Temiskaming and Northern Ontario Railway was being built through northern Ontario the rich silver ores of the Cobalt section were discovered. Prospectors followed the line of the railway and worked over the country on either side. This led to the discovery of silver in South Lorrain and Gowganda and later, gold in Porcupine and Kirkland lake. In 1922 prospectors went farther afield and found ores containing copper, zinc, gold and silver in what is now known as the Rouyn district of northwestern Quebec.

Manitoba's mineral industry now appears to be developing more rapidly so that the next few years may show outstanding progress in the mining industry of that province.

Each of these major discoveries has been the cause of a marked increase in Canada's mineral production. In 1886, the first year that the *Geological Survey* issued complete returns of mineral production, Canada's total mineral output value amounted to little more than \$10,000,000 or about \$2.23 per capita; in 1901, five years after the Yukon discoveries, production totalled nearly \$66,000,000 or \$12.16 per capita. This fell off to \$60,000,000 in 1904 but afterwards moved forward rapidly showing the results of the development of the silver properties of Cobalt and the increased production of nickel in the Sudbury area. Of the 9 million dollar increase in 1905 over 1904 in the value of Canada's mineral production, 6.3 millions were obtained from Ontario mines and of this 3.3 millions represented the increase in value of nickel production and 1.3 million dollars was credited to the increase in Ontario's silver production.

Since 1886 the value of Canada's mineral output has amounted to the aggregate of \$4,260,065,947. The boom year of 1920 showed the greatest production of any year on record until the output of 1926 was recorded and 1927 exceeded the preceding year by 2.8 per cent.

Production in 1927 was valued at \$247,356,695 or \$25.99 per capita as against an output of \$240,437,123 or \$25.61 per capita in 1926. The value of the 1927 output was 30 per cent greater than it was ten years before; 185 per cent in excess of what it was 20 years ago; and 770 per cent beyond the figure of 30 years ago.

In 1927 Canada stood first in the production of asbestos, nickel and cobalt and according to the Year Book of the American Bureau of Metal Statistics, the Dominion ranked third in the world's production of gold and silver, fourth in lead and copper and sixth in zinc. In the year under review Canada produced 95 per cent of the world's nickel, 80 per cent of the asbestos, 53 per cent of the cobalt, 9.5 per cent of the gold, 8.9 per cent of the silver, 8.4 per cent of the lead, 5 per cent of the zinc and 4.2 per cent of the copper.

Although Canada showed increases in quantities in most of the metals over 1926, yet owing to the lower prices of copper, lead, zinc and silver, the value of metal production was lower than in the preceding year.

METALLICS.—More arsenic was produced than in 1926, but the low price of this commodity does not offer much inducement to producers to increase the output very materially.

Cobalt production showed an increase of 32.5 per cent in quantity but owing to competition from producers in the Belgian Congo, output has been curtailed during the last two years. The limited world market for this metal at the present time is supplied by Canadian and African producers in about equal proportions.

Copper production showed gains in every province; and indications are that with a full year's operation of the Noranda smelter and the increase in output of nickel-copper ores in the Sudbury district, 1928 will show marked gains in the production of the red metals in Quebec and Ontario.

Gold production from Canadian ores was greater than in any other year on record. Production from the Porcupine camp in Ontario was slightly greater than in the previous year and the Kirkland lake area showed a marked improvement over the preceding year; production in British Columbia was less but gains were noted in Nova Scotia, the Yukon and Quebec.

Ontario contributed 88 per cent of Canada's output of gold; British Columbia added nearly 10 per cent; the Yukon yielded upwards of 1 per cent. Production from various other sources was small even in the aggregate.

Lead production mostly from the Consolidated Mining and Smelting Company, Limited, of Trail, B.C., treating Sullivan ores chiefly but also ores in less quantities from other mines, reached a new tonnage record. Contributing to this new aggregate in addition to Trail and the silver-lead-zinc mines of British Columbia, were the Kingdon lead mine at Galetta, Ontario; the Quebec property at Notre-Dame des Anges; and the properties in the Mayo district of the Yukon. Canada's output of lead is many times in excess of domestic requirements; as a consequence the exports of lead from Canada to the Orient and to Europe are rather large items in the country's foreign trade.

Exports of nickel in matte were less in 1927 than in 1926 but a marked increase occurred in the production of refined and electrolytic nickel produced. Nickel oxides and salts also showed an improvement over the previous year. Another feature of interest during the year was the active development of the zinc-lead property in the Sudbury district by the Bunker Hill and Sullivan company. The expectation is that within a short distance of the great nickel properties that now furnish more than 90 per cent of the world's supply of nickel, a new industry will be created for the treatment of the lead and zinc ores of the Sudbury basin.

Silver production showed a very slight increase in quantity over the previous year, but owing to the drop in price the value of production was slightly less than in 1926. Among the largest silver producers in Canada is the Sullivan mine which although primarily a world-renowned lead and zinc mine produced more than 5,000,000 ounces of silver in 1927. The Premier mine in northern British Columbia produced more than 3 million ounces. In Ontario the largest producer was the Nipissing mine with an output of 1.9 million ounces. The Mining Corporation properties in Cobalt and the Keely mine in South Lorrain produced slightly more than a million ounces each and the Frontier Lorrain slightly less than a million in 1927.

Canadian zinc production in 1927 increased 10.4 per cent in quantity but decreased 7.7 per cent in value owing to the decrease in the price of zinc during the year. Refined zinc is produced at Trail, British Columbia, from the silver-lead-zinc ores of the West Kootenay district but the greater part of the output from this province is derived from the ores of the Sullivan mine at Kimberley, B.C. Zinc concentrates are exported to Belgium from the Tétreault silver-lead-zinc property in Quebec. No other province in Canada produced zinc in 1927, but development work on copper-zinc properties in Manitoba and Quebec and on a zinc property near Chelmsford, Ontario was carried on throughout the year.

FUELS AND OTHER NON-METALLICS.—Non-metallic minerals including coal showed a gain of 3.9 per cent in value over the totals for 1926. Coal which has the greatest value of any mineral produced in Canada was the most outstanding. The 1927 production of coal constituted a record, total production being 17,426,861 tons or 5.7 per cent above the 1926 total and 3 per cent in excess of the 1923 output which was the previous record year.

The coal producing provinces, Nova Scotia, New Brunswick, Saskatchewan, Alberta, British Columbia and the Yukon all showed larger outputs than in 1926. Nova Scotia's production was 7,071,876 tons, Alberta was second on the list at 6,934,162 tons, British Columbia holding third place in output for the year accounted for 2,746,243 tons, Saskatchewan was next at 470,216 tons, New Brunswick's output totalled 203,950 tons and the Yukon is credited with 414 tons.

Crude petroleum production in Canada during 1927 showed 30.8 per cent increase in quantity and 15.6 per cent increase in value over the preceding year. The 1927 production amounted to 476,591 barrels valued at \$1,516,043; in 1926 the total was 364,444 barrels worth \$1,311,665.

Alberta's production mainly from the Turner Valley field topped the high mark of 1926 reaching a new record of 318,741 barrels. A slight increase was shown in Ontario for the year when 139,606 barrels were produced. Another feature of considerable worth was the proportionately large increase in the New Brunswick production.

Natural gas was produced in New Brunswick, Ontario and Alberta and in very small quantities in Manitoba during 1927; the total output amounted to 21,376,791 thousand cubic feet valued at \$8,043,010 in 1927 as compared with 19,208,209 thousand cubic feet worth \$7,557,174 in 1926.

Asbestos production in Canada during 1927 reached the grand total of 274,778 tons with a valuation of \$10,621,013, an average of \$38.65 per ton. This marked a decrease in quantity of 1.7 per cent but an increase in value of 5.2 per cent in comparison with 1926.

Continuing the advance in gypsum production in 1926 the shipments during 1927 created a new high mark for the industry in Canada. Increase in tonnages shipped were reported in all producing provinces except New Brunswick. Total production for the year amounted to 1,063,117 tons worth \$3,251,015, an increase of 20.3 per cent in quantity and 17.3 per cent in value over the preceding year.

Salt production continued to increase; the high record of 262,547 tons produced in 1926 was topped by the new high mark of 268,672 tons in 1927. The value of the 1927 production was \$1,614,667 as compared with a value of \$1,480,149 for the 1926 output.

In the clay products and other structural materials group increases were general, reflecting the increase in building operations during the year. Clay products as a group showed a gain of 7.8 per cent over 1926. The quantity of cement produced was greater by 15.6 per cent and the value exceeded that of 1926 by 10.6 per cent. Lime, sand and gravel and stone all showed substantial gains.

THE PROVINCES.—In 1927, on the basis of values, Ontario produced 36.38 per cent of the total mineral production of the Dominion, the value of the output being \$89,982,962. British Columbia ranked second with an output of \$60,801,170 or 24.58 per cent. Nova Scotia followed at \$30,111,221 or 12.17 per cent. Alberta ranked fourth with a production value of \$29,309,223 or 11.85 per cent to be followed by Quebec with a credit of \$23,870,403 or 11.67 per cent; Manitoba, New Brunswick, Yukon and Saskatchewan followed in the order named.

Nova Scotia ranked third among the provinces in total value of mineral output for 1927, and was first in the production of coal and gypsum. Gold, salt, clay products, and several minor minerals are also produced.

In New Brunswick non-metallic mines are of chief interest. Small deposits of manganese and antimony are known to occur but these have not been worked to any great extent in recent years. Of the non-metallics, coal is the most important but other minerals obtained are grindstones, gypsum, petroleum, natural gas, clay products, lime, stone, sand and gravel, and recently there has been some movement towards the development of oil shales.

While the main source of revenue from the mineral production of Quebec in 1927 was found in the non-metallics, the province also produced lead, zinc, silver, gold and copper. Asbestos is the chief non-metallic mineral produced and the output of this commodity from the mines in the Eastern Townships represents about 80 per cent of the world's production. Feldspar and mica are produced each year in considerable amounts. Other non-metallic minerals found in Quebec are graphite, magnesite, iron oxides, mineral waters, phosphate, pyrites, quartz and soapstone and there is a very considerable production of cement, brick, and other clay products, lime, building stone and sand and gravel. Extensive prospecting in the Rouyn field has resulted in the proving-up of many claims and the establishment of a very considerable metal mining industry in this area yielding copper, zinc, gold and silver.

Ontario, with an area of 407,262 square miles, occupies first place among the mineral-producing provinces of the Dominion, and is particularly notable for its production of gold and silver. It is in this province only that cobalt and nickel are produced. Here, too are produced one-third of Canada's copper, some arsenic, platinum, lead, natural gas, salt, gypsum, quartz, crude petroleum, feldspar, tale, mica, pyrites and small quantities of antimony bismuth palladium actinolite grinding pebbles and mineral waters. In the class of building materials there is also a large production of Portland cement, bricks and other clay products, building stone, sand and gravel, and quick and hydrated lime.

Individual mines in Ontario are said to own the largest deposits in America of talc, feldspar, mica and graphite. Porcupine and Kirkland lake are two of the most productive gold camps in the world and the rich silver ores of Cobalt, South Lorrain and Gowganda put these areas among the world's richest silver camps.

Manitoba and Saskatchewan are primarily agricultural provinces, and the annual production of minerals in each of these is valued usually between one and a half and three million dollars. In 1917 Manitoba's mineral production was in the neighbourhood of two and three-quarter million dollars. This province has a total area of 251,882 square miles. Of this, approximately two-fifths in the southern and southwestern sections, is agricultural and is also the main source of the non-metallic minerals produced in the province. The remaining three-fifths of the area is Precambrian and at different points is being prospected and developed for gold, copper and other metallic minerals. Transportation to and from the northern metal mining fields as yet is costly and for this reason the development of properties in these areas has been retarded. The principal items of interest in the minerals of Saskatchewan are lignite coal, sodium sulphate, clay products and sand and gravel. There is also in this province a supply of high-grade pottery clay. Shipments have been made from time to time to Alberta, and hope is held out that this deposit may yet prove the basis of a ceramic industry within the province.

Alberta is also a coal-producing province second only to Nova Scotia and indeed this province stood first in 1925 but in 1927 production from Alberta was some 138,000 tons less than the output of Nova Scotia. Natural gas is also an important factor in the industrial life of certain sections of the province and in the production of petroleum Alberta led Ontario and reported 47 per cent greater production than in 1926. Other mineral products from this province are salt, cement, clay products, lime, sand and gravel, stone and bituminous sands.

British Columbia has long been associated with mining, first as an alluvial gold producer and later as a producer of metals from lode mines. This province yields more than two-thirds of Canada's copper, about fifty per cent of the silver production, and the greater part of the lead and zinc produced in the Dominion. Gold production from this province amounts to about 10 per cent of the Dominion total. In this province, on Vancouver island, along the Crowsnest Pass, and in different parts of the interior, there are large coal areas. Other minerals produced in less amounts include: cement, sand and gravel, lime, building stone, clay products, quartz, pyrites, arsenic, platinum, grindstones, iron oxides and gypsum, and in recent years sodium carbonate. Production in 1927 surpassed all previous records, and in all phases of mining—prospecting, development, and production—great progress has been and still is being made in the Pacific coast province. The Sullivan mine of the Consolidated Mining and Smelting Company has now become recognized as one of the greatest lead and zinc mines in the world and the silver produced in association with these metals makes this mine the largest individual silver producer in Canada. It is also highly satisfactory that the metals, silver, lead and zinc contained in the crude ore of this mine, are now to a large extent, being smelted, refined and prepared in finished condition for the market by this company's metallurgical works at Trail.

The Yukon, with its production value of nearly 2 million dollars, showed improvement over the preceding year. It is difficult, however, to compare the production of the Yukon territory from year to year owing to the practice there of making seasonal shipments to outside smelters. The principal minerals produced are silver, lead, and alluvial gold, the latter becoming relatively less important in recent years. The Treadwell Yukon Company, a large silver-lead producer, has established a concentrator, which is of great assistance to nearby operators of smaller mines who are now able to ship to the Treadwell Yukon Company and get quick returns thus allowing them to do further development work on their properties. The Treadwell Company cannot ship in the winter and must therefore store the high-grade ore and concentrates until the opening of navigation in the spring. Thus, statements of smelter receipts and of annual shipments from the Yukon often do not agree although production may have been fairly steady in the period under review.

GENERAL STATISTICS.—A large number of Canadian mines operate continuously throughout the year although alluvial operators must shut down during the winter. Sand and gravel companies and some quarries curtail operations because of the slack time in road building and other construction operations, but on the whole where the demand for primary products is sufficiently urgent and profitable, companies must maintain a steady output regardless of climatic conditions.

The capital employed in Canadian mines in 1926 amounted to \$714,073,000 of which \$335,708,206 was invested in metal mining and metallurgical works; \$225,943,815 in coal mines and oil and gas wells; \$53,793,776 in other non-metals such as asbestos, feldspar, graphite, etc.; \$30,437,607 in the clay products industry; and \$68,189,596 in properties producing cement, lime, sand and gravel and stone.

Investments in coal mining accounted for 20 per cent of the total capital employed in the mining industry. Gold quartz mining represented another 17 per cent of the capital; metallurgical works 12 per cent; natural gas, 8 per cent; nickel-copper mining and cement manufacture about 6 per cent each; silver-cobalt and clay products about 4 per cent each, and stone quarrying, 2 per cent. Ontario mines accounted for 40 per cent of the total investment in the industry. For the other provinces, the relative capital investments in mining expressed in percentages of the total for Canada were as follows: British Columbia, 16 per cent; Quebec, 15 per cent; Alberta, 14.5 per cent; Nova Scotia, 10 per cent; Manitoba, 1.5 per cent; the remaining 3 per cent represented the investment in the provinces of New Brunswick, Saskatchewan and the Yukon Territory.

Salaries and wages paid to 84,674 employees amounted to \$104,220,892 of which \$40,284,887 was distributed among 26,343 individuals in the metal mines and metallurgical works; 37,949 people employed by coal and other non-metal mines received \$48,273,491 and clay products and other structural materials industries had 20,382 employees who received \$15,662,514. In the metal mining and metallurgical group there was a marked and steady increase in the number employed during the past five years and in the total of fuels and other non-metallic mining industries although the number employed was greater in 1927 than in 1926 yet it did not reach the total of 1923 when Canada's coal output was the greatest of all time.

In the clay products manufacture and in the production of lime, sand and gravel and stone the total number of men was the largest in the past five years while the number employed in the cement industry showed a slight decrease from the previous year. More complete returns of sand and gravel production were obtained through the co-operation in 1926 and 1927 with the Bureau of Mines of the province of Quebec who in turn co-operated with the Provincial Roads Department. The Roads Department report accounted for the major part of the production from Quebec and this in turn was reflected in the increase shown in the number of employees and in the total salaries and wages paid during the past two years in that industry.

The total cost of fuel and electricity used in the mining industry in Canada was \$22,960,284; metal mines and metallurgical works used over 45 per cent; fuels and other non-metallics, 24 per cent and structural materials and clay products accounted for the balance.

The net value of the products of the mines, smelters, quarries, sand pits, oil and gas wells, clay products and cement industries, in Canada during 1927 amounted to \$251,077,661 as against \$237,550,938 in 1926 and \$194,850,548 in 1923. This shows the remarkable growth in the industry during the past five years, but these figures must *not* be confused with the figures given as the value of *mineral production*. In calculating the mineral production, the metals recovered from Canadian mines are valued at average annual prices for these metals in recognized world markets, but the figures given in the last column of the principal statistics table represent the actual net return to the mine or metallurgical works regardless of the metal content of the shipments or the distance that the ore or other product must be shipped. As a specific example, an ore from the Mayo district of the Yukon may contain high values in silver and lead, but the return to the operator may not be very large because of the long distance the ore must be shipped. In the mineral production table, the recoverable silver and lead would be valued at the average market price for the year but in the principal statistics table only the return less freight and treatment charges are included. It is gratifying to note that this amount increases year after year showing that the products of Canadian mines are finding a ready and growing world-wide market.

IMPORTS AND EXPORTS.—Imports into Canada during the calendar year 1927 of minerals and allied products reached a value of \$496,065,376 as against \$454,387,130 in the preceding year. These consisted of iron and its products valued at \$248,151,554, non-ferrous metals worth \$59,195,656, non-metallic minerals valued at \$155,404,666, and chemicals and allied products worth \$33,313,500. In the previous year, imports of iron and its products amounted to \$219,575,146; non-ferrous metals, \$50,765,605; non-metallic minerals, \$152,687,995; and chemicals and allied products, \$31,358,384. Exports of similar products during the same period

amounted to \$199,086,788, which was slightly lower than the preceding year when the exports totalled \$201,194,606. The 1927 exports of iron and its products were valued at \$67,831,374 as against \$75,602,162 in the previous year; non-ferrous metals, \$87,057,150 as against \$82,009,639; non-metallic minerals \$26,343,349 as against \$27,095,283; and chemicals and allied products, \$17,854,915, as compared with \$16,487,522 during the year ending December 31, 1926.

An analysis of the trend of Canada's external trade in these four groups during 1927 shows that the value of imports from the United States made up 83.5 per cent of the total brought in from all foreign sources; 8.5 per cent of the value of purchases represented goods from the United Kingdom; and the balance was derived from other countries, chief among which were, Germany, Belgium, Sweden, France, the Netherlands, Switzerland, and Argentina. Of the total exports of these commodities 38 per cent went to the United States and 32 per cent to the British Empire, of which the United Kingdom, Australia, British India, and New Zealand were the largest purchasers. Among the remaining countries of the world the largest importers were Japan, Argentina, Germany, the Netherlands, China, France, Brazil and Dutch East Indies.

Chief among the exports of iron and its products during 1927 were automobiles and automobile parts valued at \$32,000,000 and farm implements at \$16,000,000; among the non-ferrous metals, gold and silver in the form of bullion and in ore was valued at over \$20,000,000; copper in blister form, in ore, scrap, wire, and in other forms worth \$15,000,000; pig lead and lead in ore, \$13,000,000; nickel in its various forms, \$15,000,000; zinc spelter, ore, scrap and dross, \$7,800,000, and aluminium in bars, blocks, scrap and manufactures, \$10,600,000. Among the exports of non-metallic minerals, asbestos headed the list at \$10,800,000, followed by coal worth \$6,000,000; among the remaining items artificial abrasives at nearly \$2,600,000, crude petroleum and gypsum each at slightly under \$1,000,000 were the largest. In the chemicals and allied products group, cyanamide at \$4,600,000; soda and soda compounds worth \$3,900,000; acids at \$3,000,000; and calcium carbide at \$900,000 lead the list.

Table 4—Exchange Table Showing the Amount Paid in Canadian Dollars for One United States Dollar by Months, 1923-1927

Month	1923	1924	1925	1926	1927
	\$	\$	\$	\$	\$
January.....	1-0067	1-0275	1-0026	1-0020	1-0016
February.....	1-0119	1-0322	1-0014	1-0034	1-0016
March.....	1-0208	1-0294	1-0013	1-0037	1-0037
April.....	1-0203	1-0184	1-0005	0-9996	0-9990
May.....	1-0222	1-0166	1-0000	0-9992	0-9993
June.....	1-0231	1-0141	1-0000	0-9989	1-0006
July.....	1-0263	1-0064	0-9995	0-9987	1-0015
August.....	1-0244	1-0011	0-9995	0-9985	1-0006
September.....	1-0233	1-0078	1-0001	0-9986	0-9995
October.....	1-0156	1-0016	0-9992	0-9993	0-9989
November.....	1-0181	1-0000	0-9992	0-9986	0-9986
December.....	1-0239	1-0015	1-0003	1-0006	1-0010
Average.....	1-0197	1-0131	1-0003	1-0001	1-0005

Table 5—Metal Prices 1923-1927

Commodity	Market	Unit	1923	1924	1925	1926	1927
			\$	\$	\$	\$	\$
Antimony (ordinaries).....	New York.....	Pound....	0-07897	0-10836	0-17494	0-15988	0-12393
Arsenic, white.....	New York.....	Pound....	0-12050	0-09636	0-0466	0-0350	0-0383
Cobalt.....	New York.....	Pound....	2-85	2-75	2-50	2-50	2-50
Cobalt oxide.....	New York.....	Pound....	2-10	2-10	2-10	2-10	2-10
Copper.....	New York.....	Pound....	0-14421	0-13024	0-14042	0-13795	0-12920
	Montreal.....	Pound....	0-16607	0-15155	0-1615	0-1577	0-1478
	New York.....	Pound....	0-07267	0-08097	0-09020	0-08417	0-06755
Lead.....	Montreal.....	Pound....	0-07179	0-08104	0-0912	0-08154	0-0673
	Toronto.....	Pound....	0-07257	0-08118	0-0919	0-08274	0-0683
	London.....	Pound....	.....	.....	0-07914	0-06751	0-05256
Nickel.....	New York.....	Pound....	0-29	0-28	0-34	0-36	0-36
Platinum.....	New York.....	Ounce....	116-537	118-817	119-093	113-269	84-636
Silver.....	New York.....	Ounce....	0-64873	0-66781	0-69065	0-62107	0-56370
Tin.....	New York.....	Pound....	0-41799	0-49674	0-56790	0-63615	0-62747
	St. Louis.....	Pound....	0-06607	0-06344	0-07622	0-07337	0-06242
Zinc.....	Montreal.....	Pound....	0-08267	0-07837	0-0906	0-08825	0-07710
	London.....	Pound....	.....	0-0670	0-07956	0-07410	0-06194

Table 6—Prices of Non-Metallic Minerals and Structural Materials, 1923-1927, Showing the Average Returns Received by Producers, f.o.b. Shipping Points in Canada as Computed from the Total Receipts and Total Shipments for the Year

Commodity	Unit	1923	1924	1925	1926	1927
		\$	\$	\$	\$	\$
NON-METALLICS						
Actinolite.....	Ton.....	11-00	13-60	12-50	12-50	12-50
Asbestos.....	Ton.....	32-50	29-73	30-95	36-14	38-65
Barytes.....	Ton.....	20-89	21-90	23-77	23-07	22-64
Bituminous sands.....	Ton.....			4-00	4-00	4-00
Chromite.....	Ton.....		Transferred	to Metallic s.		
Coal.....	Ton.....	4-24	3-93	3-75	3-63	3-55
Diatomite.....	Ton.....	25-00	25-40			25-00
Feldspar.....	Ton.....	8-13	8-00	8-22	8-63	8-68
Fluorspar.....	Ton.....	12-46	17-66	4-94		
Garnets.....	Ton.....					75-00
Graphite.....	Ton.....	60-98	57-05	61-79	71-45	61-04
Grinding pebbles.....	Ton.....			9-00	9-00	
Grindstones.....	Ton.....	39-76	48-60	48-46	56-11	55-53
Gypsum (crushed).....	Ton.....	1-90	1-82	1-83	3-13	3-06
Iron Oxides.....	Ton.....	12-43	12-54	12-91	15-37	16-90
Magnesite.....	Ton.....	27-99	26-17	21-93	30-07	31-39
Magnesium sulphate.....	Ton.....	54-38				
Manganese.....	Ton.....		Transferred	to Metallic s.		
Mica (rough cobbled).....	Pound.....	0-10	0-06	0-05	0-04	0-03
Mineral water.....	Gal.....	0-07	0-07	0-14	0-14	0-04
Natro-alumite.....	Ton.....	50-00		50-00		35-43
Natural gas.....	M cu. ft.....	0-36	0-38	0-40	0-39	0-38
Peat.....	Ton.....			6-12		
Petroleum, crude.....	Brl.....	3-06	2-91	3-76	3-59	3-18
Phosphate.....	Ton.....	20-00		11-81	20-00	11-37
Pyrites.....	Ton.....	3-95	4-06	3-77	3-58	3-90
Quartz.....	Ton.....	2-26	2-14	1-84	2-38	2-12
Salt.....	Ton.....	8-46	6-61	6-04	5-63	6-00
Silica brick.....	M.....					44-40
Sodium carbonate.....	Ton.....		7-26	9-02		12-41
Sodium sulphate.....	Ton.....	13-90	5-54	5-06	2-00	2-00
Talc.....	Ton.....	14-51	13-63	14-22	13-77	14-29
Volcanic dust.....	Ton.....			8-62	7-00	7-00
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement, portland and puzzolan.....	Brl.....	2-00	1-78	1-73	1-49	1-43
Clay products—						
Brick, common.....	M.....	15-50				
Brick, pressed.....	M.....	19-91				
Brick, hollow building.....	M.....	80-35				
Brick, moulded and ornamental.....	M.....	20-95				
Brick, face.....	Soft mud process.....		17-10	18-83	19-71	20-67
Brick, common.....			14-89	11-20	14-65	16-44
Brick, face.....	Stiff mud process, wire		22-86	20-06	21-24	21-19
Brick, common.....			15-09	14-08	17-26	14-90
Brick, face.....	Dry press.....		21-60	21-50	21-40	20-96
Brick, common.....			13-13	12-24	13-40	12-79
Brick, fancy or ornamental.....	M.....		130-41	50-20	52-07	47-37
Brick, sewer.....	M.....		15-15	21-07	17-90	19-15
Firebrick.....	M.....	48-19	48-36	49-27	45-83	45-70
Fireclay.....	Ton.....	9-00	7-20	10-50	9-25	7-08
Hollow blocks.....	Ton.....			9-46	9-25	9-45
Floor tile.....	Sq. ft.....			0-20	0-22	0-24
Kaolin.....	Ton.....	14-53				
Paving brick.....	M.....				41-10	42-12
Roofing tile.....	No.....			0-08	0-09	0-07
Sewer pipe.....	Ton.....	23-01	20-87	19-51	19-48	19-10
Tile, drain.....	M.....	30-50	27-04	27-59	27-77	26-86
Lime.....	Bush.....	0-33	0-34	0-33	0-32	0-30
Sand and gravel.....	Ton.....	0-24	0-28	0-29	0-28	0-26
Stone—						
Granite.....	Ton.....	2-91	2-41	2-07	1-48	1-89
Limestone.....	Ton.....	1-21	1-14	1-08	1-07	1-10
Marble.....	Ton.....	81-49	73-63	83-69	98-50	96-57
Sandstone.....	Ton.....	2-92	2-54	1-66	2-54	1-75

Table 7—Annual Values of the Mineral Production of Canada, 1886-1927

Year	Value of production	Value per capita	Year.	Value of production	Value per capita
	\$	\$		\$	\$
1886.....	10,221,255	2.23	1907.....	86,865,202	13.75
1887.....	10,321,331	2.23	1908.....	85,557,101	13.16
1888.....	12,518,894	2.67	1909.....	91,821,441	13.70
1889.....	14,013,113	2.96	1910.....	106,823,623	14.93
1890.....	16,763,353	3.50	1911.....	103,220,994	14.32
1891.....	18,976,616	3.92	1912.....	135,048,296	18.33
1892.....	16,623,415	3.39	1913.....	145,634,812	19.35
1893.....	20,035,082	4.04	1914.....	128,863,075	16.75
1894.....	19,931,158	3.98	1915.....	137,109,171	17.44
1895.....	20,505,917	4.05	1916.....	177,201,534	22.05
1896.....	22,474,256	4.38	1917.....	189,646,821	23.18
1897.....	28,485,023	5.49	1918.....	211,301,897	25.37
1898.....	38,412,431	7.32	1919.....	176,686,390	20.84
1899.....	49,234,005	9.27	1920.....	227,859,665	26.40
1900.....	64,420,877	12.04	1921.....	171,923,342	19.56
1901.....	65,797,911	12.16	1922.....	184,297,242	20.55
1902.....	63,231,836	11.36	1923.....	214,079,331	23.41
1903.....	61,740,513	10.53	1924.....	209,583,406	22.71
1904.....	60,082,771	10.27	1925.....	226,583,333	24.19
1905.....	69,078,999	11.49	1926.....	240,437,123	25.61
1906.....	79,286,697	12.81	1927.....	247,356,695	25.99

Table 8—Annual Values of the Mineral Production of Canada by Classes, 1907-1927

Year	Metallics	Non-metallics including fuels	Clay * products and other structural materials	Total
	\$	\$	\$	\$
1907.....	42,426,607	31,275,546	12,863,049	(a) 86,865,202
1908.....	41,774,362	32,142,784	11,339,955	(a) 85,557,101
1909.....	44,156,841	31,141,251	16,533,349	91,831,441
1910.....	49,438,873	37,757,158	19,627,592	106,823,623
1911.....	46,105,423	34,405,960	22,709,611	103,220,994
1912.....	61,172,753	45,080,674	28,794,869	135,048,296
1913.....	66,361,351	48,463,709	30,809,752	145,634,812
1914.....	59,386,619	43,467,229	26,009,227	128,863,075
1915.....	75,814,841	43,373,571	17,920,759	137,109,171
1916.....	106,319,365	53,414,983	17,467,186	177,201,534
1917.....	106,455,147	63,354,363	19,837,311	189,646,821
1918.....	114,549,152	77,621,946	19,130,799	211,301,897
1919.....	73,262,793	76,002,087	27,421,510	176,686,390
1920.....	77,939,630	108,027,947	41,892,088	227,859,665
1921.....	49,343,232	87,842,682	34,737,428	171,923,342
1922.....	61,785,707	82,976,794	39,534,741	184,297,242
1923.....	84,391,218	91,936,732	37,751,381	214,079,331
1924.....	102,406,528	71,796,009	35,380,869	209,583,406
1925.....	117,082,298	71,851,801	37,649,234	226,583,333
1926.....	115,237,581	85,240,144	39,959,398	240,437,123
1927.....	113,561,030	88,986,246	44,809,419	247,356,695

(a) Total includes \$300,000 allowed for products not reported.

Table 9.—Values of the Mineral Production of Canada by Provinces, 1899-1927

Year	Nova Scotia*	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1899.....	6,817,274	420,227	2,585,635	9,819,557		17,108,707		12,482,605	Included
1900.....	9,298,479	439,060	3,292,383	11,258,099		23,452,330		16,680,526	with
1901.....	7,770,159	467,985	3,759,984	13,970,010		19,297,940		20,531,833	Mani-
1902.....	10,686,549	607,129	3,743,636	14,619,091		16,127,400		17,448,031	toba,
1903.....	11,431,914	580,495	3,585,938	14,160,033		14,082,986		17,899,147	Saskat-
1904.....	11,212,746	559,913	3,688,482	12,582,843		12,713,613		19,325,174	chewan
1905.....	11,507,047	559,035	4,405,975	18,833,292		11,387,642		22,336,008	and
1906.....	12,894,303	646,328	5,242,058	25,111,682		10,092,726		25,299,600	Alberta
1907.....	14,532,040	664,467	6,205,553	30,381,638	898,775	533,251	4,657,524	25,656,056	3,335,898
1908.....	14,487,108	579,816	6,372,949	30,623,812	584,374	413,212	5,122,508	23,704,035	3,669,290
1909.....	12,504,810	657,035	7,086,265	37,374,577	1,193,377	456,246	6,047,447	22,479,006	4,032,678
1910.....	14,195,730	581,942	8,270,136	43,538,078	1,500,359	498,122	8,996,210	24,478,572	4,764,474
1911.....	15,409,397	612,830	9,304,717	42,796,162	1,791,772	636,706	6,662,673	21,299,305	4,707,432
1912.....	18,922,236	771,004	11,656,998	51,985,876	2,463,074	1,165,642	12,073,589	30,076,635	5,933,242
1913.....	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	881,142	15,054,046	28,086,312	6,276,737
1914.....	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	712,313	12,684,234	24,164,039	5,418,185
1915.....	18,088,342	903,467	11,619,275	61,071,287	1,318,387	451,933	9,909,347	28,689,425	5,057,708
1916.....	20,042,262	1,118,187	14,406,598	80,461,323	1,823,576	590,473	13,297,543	39,969,962	5,491,610
1917.....	21,104,542	1,435,024	17,400,077	89,066,600	2,628,264	860,651	16,527,535	36,141,926	4,482,202
1918.....	22,317,108	2,144,017	19,605,347	94,694,093	3,120,600	1,019,781	23,109,987	42,935,333	3,355,631
1919.....	23,445,215	1,770,945	21,267,947	67,917,998	2,868,378	1,521,964	21,087,582	34,865,427	1,940,934
1920.....	34,130,017	2,491,787	28,886,214	81,715,808	4,223,461	1,887,468	33,586,456	39,411,728	1,576,726
1921.....	28,912,111	1,901,505	15,157,094	57,356,651	1,934,117	1,114,220	30,662,229	33,230,460	1,754,955
1922.....	25,925,499	2,263,692	17,647,939	65,866,029	2,258,942	1,255,470	27,872,136	39,423,962	1,785,573
1923.....	29,648,893	2,462,457	20,308,763	80,825,851	1,768,037	1,047,583	31,287,536	43,757,388	2,972,823
1924.....	23,820,352	1,969,260	19,136,504	86,398,656	1,534,249	1,128,100	22,344,940	52,298,533	952,812
1925.....	17,625,612	1,743,858	24,284,527	87,980,436	2,276,759	1,076,392	25,318,866	64,485,242	1,791,641
1926.....	28,875,792	1,811,104	25,956,193	84,702,296	3,073,528	1,193,394	26,977,027	65,622,976	2,226,813
1927.....	30,111,221	2,148,535	28,870,403	89,982,932	2,888,912	1,455,225	29,309,223	60,801,170	1,789,044

*Includes a small production from Prince Edward Island.

Table 10.—Percentage of the Total Value of the Mineral Production of Canada Produced by Each Province, 1923-1927

Province	1923	1924	1925	1926	1927
Nova Scotia*	13.85	11.38	7.78	12.01	12.17
New Brunswick	1.15	0.94	0.77	0.75	0.87
Quebec	9.49	9.12	10.72	10.79	11.67
Ontario	37.76	41.29	38.82	35.23	36.38
Manitoba	0.83	0.73	1.01	1.28	1.17
Saskatchewan	0.49	0.54	0.48	0.50	0.59
Alberta	14.60	10.61	11.17	11.22	11.85
British Columbia	20.44	24.94	28.46	27.29	24.58
Yukon	1.39	0.45	0.79	0.93	0.72
Canada	100.00	100.00	100.00	100.00	100.00

*Includes a small percentage from Prince Edward Island.

Table 11—Values of the Mineral Production of Canada, by Provinces, and by Classes, 1927

Province	Metallies	Non-metallies including fuels	Clay products and other structural materials	Total
	\$	\$	\$	\$
Nova Scotia.....	65,907	28,885,113	1,160,201	30,111,221
New Brunswick.....		1,673,170	475,365	2,148,535
Quebec.....	2,408,057	11,388,639	15,073,707	28,870,403
Ontario.....	62,852,482	7,468,442	19,662,038	89,982,962
Manitoba.....	3,769	512,068	2,373,075	2,888,912
Saskatchewan.....		880,921	574,304	1,455,225
Alberta.....	871	26,766,663	2,541,689	29,309,223
British Columbia.....	46,442,952	11,409,178	2,949,040	60,801,170
Yukon Territory.....	1,786,992	2,052		1,789,044
Canada.....	113,561,030	88,986,246	44,809,419	247,356,695

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1923-1927

Year	Number of active operators	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
Metal Mining Industry						
ALLUVIAL GOLD						
1923.....	138	10,703,650	307	467,807	.....	1,646,705
1924.....	89	21,871,256	264	389,079	.....	1,038,013
1925.....	99	22,095,669	363	347,448	.....	1,270,419
1926.....	108	4,702,808	285	339,841	44,482	879,886
1927.....	94	9,653,723	321	472,596	30,834	794,033
AURIFEROUS QUARTZ						
1923.....	65	77,574,976	5,524	8,961,434	1,497,197	25,021,837
1924.....	70	83,982,765	6,738	10,500,140	1,559,406	31,298,107
1925.....	52	84,964,062	7,052	11,931,948	1,836,050	35,035,361
1926.....	60	103,945,022	7,663	12,340,623	2,083,811	35,171,561
1927.....	72	118,381,468	8,022	12,935,719	2,222,085	37,452,995
COPPER-GOLD-SILVER						
1923.....	14	19,108,072	1,790	3,004,292	334,696	4,361,486
1924.....	15	19,099,845	2,118	3,292,228	366,153	5,226,859
1925.....	40	23,200,580	2,374	3,555,844	413,767	7,758,990
1926.....	76	27,936,685	3,403	4,546,493	541,914	9,973,049
1927.....	118	24,232,169	4,083	5,260,095	596,137	9,822,881
SILVER-COBALT						
1923.....	18	31,334,050	1,408	1,949,738	410,089	6,521,853
1924.....	26	41,013,466	1,769	2,534,304	468,651	6,594,032
1925.....	33	44,045,619	1,788	2,576,414	498,874	6,611,644
1926.....	33	40,504,721	1,779	2,815,939	518,907	5,470,433
1927.....	23	30,123,645	1,458	2,178,163	472,548	4,760,546
SILVER-LEAD-ZINC						
1923.....	87	9,203,997	1,352	2,024,752	257,574	6,620,067
1924.....	82	12,328,511	1,936	2,943,635	474,343	16,600,970
1925.....	89	15,735,930	2,538	3,867,613	584,121	21,902,686
1926.....	108	22,699,417	2,924	4,431,730	658,679	26,190,034
1927.....	157	28,036,330	3,106	4,807,817	588,520	17,520,130
NICKEL-COPPER						
1923.....	3	23,168,812	1,081	1,421,086	181,729	3,562,065
1924.....	3	37,189,778	1,421	1,880,823	150,460	4,235,934
1925.....	2	38,691,594	1,412	1,867,217	105,570	3,794,244
1926.....	2	38,593,359	1,437	1,963,617	95,621	4,627,175
1927.....	2	39,272,609	1,617	2,486,313	120,686	5,223,668
(a) MISCELLANEOUS						
1923.....	6	5,504,796	42	34,687	2,257	463,960
1924.....	4	5,000	42	16,436	4,010	71,422
1925.....	3	109,583	33	17,301	2,007	23,110
1926.....	2	87,588	25	10,626	3,844	11,072
1927.....	5	641,600	65	23,944	460	8,980
NON-FERROUS METAL SMELTING AND REFINING						
1923.....	8	64,290,931	4,968	7,930,236	5,221,278	20,414,963
1924.....	7	66,337,664	5,521	8,136,251	4,765,483	21,760,273
1925.....	5	61,691,928	5,104	8,568,997	5,280,674	29,304,384
1926.....	7	81,779,240	6,226	9,584,938	6,076,627	33,615,909
1927.....	8	85,366,662	7,671	12,120,240	6,380,127	45,479,578

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1923-1927—Continued

Year	Number of active operators	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
Total Metal Mining Industries						
1923.....	339	249,889,284	16,472	25,794,032	7,904,820	68,612,936
1924.....	296	281,828,285	19,809	29,692,896	7,783,506	86,825,610
1925.....	323	290,534,965	20,664	32,732,782	8,721,063	105,700,838
1926.....	396	320,243,840	23,742	36,033,798	10,023,885	115,939,119
1927.....	479	335,708,206	26,343	40,284,887	10,411,397	121,062,811
Non-Metal Mining Industries including Fuels						
(b) FUELS						
COAL						
1923.....	459	143,447,448	32,046	46,215,712	4,756,308	68,817,610
1924.....	451	146,711,531	27,183	35,123,490	4,358,987	50,633,113
1925.....	460	145,006,440	25,032	33,200,309	4,069,634	46,835,788
1926.....	433	148,278,315	28,368	35,841,796	4,631,691	56,494,375
1927.....	385	146,392,808	29,772	38,955,967	3,558,926	58,439,742
NATURAL GAS						
1923.....	192	38,722,854	867	1,050,366	2,587	5,675,493
1924.....	186	50,561,757	1,240	1,315,405	3,059	5,512,570
1925.....	161	48,895,802	1,059	1,206,875	13,396	6,588,424
1926.....	169	57,231,261	1,254	1,448,778	40,444	7,350,170
1927.....	172	56,777,091	1,342	1,535,498	11,181	7,689,916
PETROLEUM						
1923.....	117	2,934,213	151	118,231	17,130	522,018
1924.....	119	5,650,086	158	152,957	13,656	467,400
1925.....	180	7,954,722	259	318,101	20,990	1,250,705
1926.....	210	17,639,142	634	788,843	77,902	1,311,605
1927.....	206	22,773,916	781	1,120,224	112,763	1,516,043
TOTAL FUELS						
1923.....	768	185,104,615	33,064	47,384,309	4,776,025	75,015,121
1924.....	760	208,928,874	28,681	50,691,852	4,880,702	86,618,083
1925.....	791	201,856,964	26,350	54,725,235	4,104,020	54,674,817
1926.....	812	225,148,718	30,866	58,079,417	4,760,037	65,166,210
1927.....	763	225,943,816	31,895	41,611,689	3,688,870	67,645,701
OTHER NON-METAL MINING INDUSTRIES						
ABRASIVES						
1923.....	5	160,094	62	50,200	4,892	80,083
1924.....	5	156,095	76	64,312	5,260	130,828
1925.....	8	154,733	62	55,466	5,408	126,490
1926.....	8	358,342	102	90,069	9,716	152,433
1927.....	9	433,810	132	107,603	10,279	132,552
ASBESTOS						
1923.....	14	42,715,557	3,165	3,607,178	920,826	7,522,506
1924.....	15	43,216,966	2,597	2,977,304	790,046	6,710,830
1925.....	14	38,133,046	2,582	2,997,107	923,239	8,988,360
1926.....	8	34,905,096	2,797	3,544,097	1,012,232	10,099,423
1927.....	7	35,316,821	2,976	3,761,192	1,046,541	10,621,013

Table 12.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1923-1927—Continued

Year	Number of active operators	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries
		\$		\$	\$	\$
OTHER NON-METAL MINING INDUSTRIES—Continued						
FELDSPAR						
1923.....	25	948,973	298	193,001	13,965	237,601
1924.....	25	953,525	290	223,937	16,866	358,540
1925.....	23	712,329	240	165,766	11,141	235,789
1926.....	29	582,350	410	213,571	14,654	310,238
1927.....	29	322,978	234	151,553	10,232	259,151
GRAPHITE						
1923.....	3	552,947	62	27,826	7,614	67,873
1924.....	4	647,947	75	55,449	12,163	76,117
1925.....	6	902,310	106	75,021	14,718	158,763
1926.....	3	1,132,273	68	63,064	10,804	194,860
1927.....	Included with Miscellaneous					
GYPSUM						
1923.....	15	4,249,628	1,225	1,017,556	190,906	2,243,100
1924.....	14	4,423,697	1,219	1,114,468	181,003	2,208,108
1925.....	15	4,506,995	1,039	1,018,585	189,649	2,389,891
1926.....	18	6,696,077	1,368	1,255,427	241,414	2,770,813
1927.....	19	9,055,624	1,427	1,311,688	198,199	3,251,015
IRON OXIDES						
1923.....	6	209,340	60	49,056	17,677	129,636
1924.....	5	193,633	38	33,221	16,815	91,160
1925.....	5	173,940	47	35,454	16,073	91,913
1926.....	5	178,078	45	38,348	17,576	101,843
1927.....	5	153,317	48	38,680	18,222	103,536
MICA						
1923.....	33	223,650	219	112,469	4,772	326,974
1924.....	50	249,876	223	127,201	5,532	357,272
1925.....	36	190,144	269	123,079	4,528	261,463
1926.....	22	186,478	208	128,269	5,353	229,204
1927.....	21	322,389	168	118,505	4,400	174,377
QUARTZ						
1923.....	11	1,044,456	278	284,189	55,985	599,250
1924.....	11	991,863	171	172,397	34,281	323,156
1925.....	14	1,005,159	153	145,494	20,495	363,612
1926.....	17	1,056,705	243	208,839	44,311	553,161
1927.....	19	963,316	267	271,555	34,423	496,364
SALT						
1923.....	11	2,406,992	368	412,597	356,794	1,713,516
1924.....	11	2,479,563	364	431,618	342,118	1,374,780
1925.....	12	2,563,508	402	467,487	315,368	1,410,697
1926.....	11	2,782,728	384	482,651	324,612	1,480,149
1927.....	10	3,194,802	376	499,967	287,260	1,614,667
TALC AND SOAPSTONE						
1923.....	6	679,337	60	59,321	15,504	150,507
1924.....	6	695,786	61	59,220	18,351	154,480
1925.....	7	744,037	92	74,519	22,218	205,935
1926.....	6	681,434	92	74,634	25,023	217,195
1927.....	8	715,439	122	87,721	25,169	236,105

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1923-1927—Continued

Year	Number of active operators	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER NON-METAL MINING INDUSTRIES—Concluded</i>						
<i>MISCELLANEOUS</i>						
1923.....	28	4,809,738	199	230,562	57,392	400,064
1924.....	33	2,428,619	136	82,937	14,948	240,718
1925.....	28	2,080,481	218	149,655	58,437	273,327
1926.....	28	2,400,850	193	201,468	79,877	386,892
1927.....	32	3,315,380	304	313,338	85,302	670,950
<i>TOTAL OTHER NON-METAL MINING INDUSTRIES</i>						
1923.....	157	58,000,712	5,996	6,043,955	1,646,327	13,471,110
1924.....	179	56,437,670	5,250	5,342,064	1,407,333	12,025,985
1925.....	163	51,166,682	5,210	5,307,633	1,581,274	14,506,140
1926.....	155	50,960,411	5,910	6,300,437	1,785,572	16,496,211
1927.....	159	53,793,776	6,054	6,661,802	1,720,027	17,559,730
<i>Total Non-Metal Mining Industries Including Fuels</i>						
1923.....	925	243,105,227	39,060	53,428,264	6,422,352	88,486,231
1924.....	935	259,360,944	33,831	41,933,916	5,788,085	68,639,068
1925.....	919	253,023,646	31,560	40,032,918	5,685,294	69,181,057
1926.....	967	274,109,129	36,166	44,379,854	6,535,609	81,652,421
1927.....	922	279,737,591	37,949	48,273,491	5,402,897	85,205,431
<i>Clay Products and Other Structural Materials</i>						
<i>CLAY PRODUCTS</i>						
<i>BRICK AND TILE</i>						
1923.....	202	24,866,834	3,954	4,045,487	2,254,445	8,220,269
1924.....	187	24,423,104	3,332	3,071,379	1,508,573	7,046,355
1925.....	168	22,410,450	3,403	3,167,926	1,565,341	7,374,551
1926.....	178	23,034,976	3,644	3,468,052	1,761,516	8,146,514
1927.....	167	24,795,253	3,977	3,828,106	1,786,684	8,995,741
<i>CLAY SEWER PIPE</i>						
1923.....	5	3,022,522	459	561,515	307,681	1,421,002
1924.....	5	3,149,838	467	596,598	281,448	1,343,197
1925.....	5	2,810,782	382	461,527	240,038	1,182,454
1926.....	5	3,026,076	407	497,512	227,456	1,177,247
1927.....	5	3,246,183	421	506,730	214,088	1,137,284
<i>FIRE BRICK AND OTHER FIRE CLAY PRODUCTS</i>						
1923.....	6	1,786,353	192	286,377	90,286	605,968
1924.....	7	1,850,385	208	258,416	74,431	584,838
1925.....	6	2,114,738	220	274,919	88,552	702,707
1926.....	5	1,780,967	188	249,471	75,544	706,984
1927.....	5	2,009,449	199	263,910	71,789	715,608
<i>STONEWARE AND POTTERY</i>						
1923.....	4	314,862	119	117,221	14,607	230,924
1924.....	6	387,667	113	114,925	14,642	240,687
1925.....	4	424,894	131	129,703	15,660	269,979
1926.....	4	310,043	149	130,254	15,538	322,726
1927.....	5	359,918	152	50,965	12,956	311,085
<i>TOTAL CLAY PRODUCTS*</i>						
1923.....	219	32,294,371	4,750	5,011,700	2,667,115	10,483,016
1924.....	205	29,810,994	4,120	4,041,318	1,879,094	9,215,077
1925.....	183	27,760,864	4,158	4,034,075	1,909,591	9,529,691
1926.....	194	28,152,062	4,395	4,346,687	2,080,054	10,357,323
1927.....	185	30,437,607	4,776	4,769,307	2,088,724	11,173,189

*Includes kaolin and other clays.

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1923-1927—Concluded

Year	Number of active operators	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER STRUCTURAL MATERIALS</i>						
<i>CEMENT</i>						
1923	6	38,284,494	1,842	2,551,784	2,809,414	15,064,661
1924	6	36,766,574	1,837	2,531,622	2,872,711	13,398,411
1925	7	38,081,583	1,926	2,511,400	2,848,904	14,046,704
1926	7	41,380,000	2,340	3,052,662	3,424,156	13,013,283
1927	6	40,509,319	2,270	3,143,932	3,546,000	14,391,937
<i>LIME</i>						
1923	50	6,050,954	1,197	1,191,416	953,709	3,266,608
1924	44	5,165,964	927	970,672	740,878	3,178,541
1925	56	5,154,046	1,006	960,434	762,814	3,387,652
1926	54	5,825,809	1,106	1,082,854	788,990	3,781,484
1927	53	6,200,481	1,132	1,133,708	826,436	3,923,388
<i>SAND AND GRAVEL</i>						
1923	598	4,487,005	801	692,161	99,409	3,016,518
1924	558	5,194,037	927	848,741	134,378	3,181,083
1925	622	5,286,268	1,650	1,231,856	158,645	3,220,410
1926	580	6,274,090	5,672	1,557,232	151,236	4,941,434
1927	483	7,668,812	7,133	2,043,962	188,327	6,055,601
<i>STONE</i>						
1923	158	13,725,677	2,850	2,665,520	400,517	5,920,578
1924	170	14,317,148	2,877	2,768,256	383,800	6,407,767
1925	201	12,233,773	4,148	3,599,653	479,489	7,464,777
1926	229	12,760,078	4,510	3,763,726	514,374	7,865,874
1927	222	13,810,984	5,071	4,571,605	496,503	9,265,904
<i>TOTAL OTHER STRUCTURAL MATERIALS</i>						
1923	812	62,548,130	6,690	7,100,881	4,263,049	27,268,365
1924	778	61,443,723	6,668	7,119,291	4,131,767	26,165,792
1925	886	60,755,670	8,780	8,303,343	4,249,352	28,119,543
1926	870	66,239,977	13,688	9,456,474	4,878,756	29,602,075
1927	764	68,189,596	15,606	10,898,207	5,057,268	33,636,280
<i>Total Clay Products and Other Structural Materials</i>						
1923	1,031	94,842,501	11,420	12,112,581	6,930,164	37,751,381
1924	983	91,254,717	10,688	11,160,609	6,010,861	35,380,869
1925	1,069	88,516,534	12,866	12,337,418	6,159,443	37,649,234
1926	1,064	94,392,039	18,023	13,803,161	6,958,810	39,959,398
1927	949	98,627,203	20,382	15,662,514	7,145,990	44,809,419
<i>GRAND TOTAL OF ALL INDUSTRIES</i>						
1923	2,295	578,837,012	66,952	91,334,877	21,257,336	194,850,548
1924	2,214	632,443,946	64,328	82,787,421	19,537,452	190,845,547
1925	2,351	632,075,145	65,090	85,103,118	20,565,800	212,531,129
1926	2,427	638,750,008	77,931	94,216,813	23,518,304	237,550,938
1927	2,359	714,073,000	84,674	104,220,892	22,960,284	251,077,661

(a) Includes value of pig iron made from Canadian ore deducting the net value of ores treated, in 1923 and 1924.
 (b) Production of peat for 1925 included in the miscellaneous non-metallics.

Table 13.—Principal Statistics of the Mineral Industry in Canada by Provinces, 1923-1927

Year	Number of active operators	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
*NOVA SCOTIA						
1923.....	80	63,544,560	15,280	17,613,514	2,927,317	27,759,500
1924.....	72	59,608,296	14,172	14,247,382	2,772,595	21,996,864
1925.....	67	59,456,860	9,905	12,488,285	2,229,275	16,412,311
1926.....	72	60,812,087	13,993	16,109,519	2,941,725	26,702,119
1927.....	78	70,934,465	15,663	18,076,122	2,283,744	27,966,861
NEW BRUNSWICK						
1923.....	44	3,300,139	1,334	1,339,229	154,823	2,434,312
1924.....	39	3,362,851	1,190	1,104,918	120,950	1,959,030
1925.....	36	3,070,322	1,113	1,003,169	114,629	1,734,613
1926.....	42	3,533,577	1,127	952,696	143,264	1,794,836
1927.....	41	3,014,614	1,196	1,092,891	125,847	2,106,635
QUEBEC						
1923.....	152	79,271,782	7,124	7,446,475	3,031,056	20,270,322
1924.....	240	77,163,613	6,953	7,300,935	2,800,763	18,921,732
1925.....	294	83,449,054	8,700	8,566,616	3,152,395	23,817,132
1926.....	331	112,460,615	15,555	11,912,344	4,662,165	31,629,450
1927.....	381	110,769,954	18,012	15,104,472	4,988,922	39,617,797
ONTARIO						
1923.....	1,224	240,899,437	17,978	23,469,827	9,932,155	71,042,009
1924.....	1,120	261,071,390	19,265	24,624,854	8,679,474	75,216,531
1925.....	1,209	258,967,755	19,346	25,909,951	8,463,276	86,641,647
1926.....	1,142	278,657,190	20,060	26,987,635	8,668,666	84,710,014
1927.....	1,014	282,205,248	21,147	28,753,161	8,642,617	88,824,642
MANITOBA						
1923.....	29	5,776,757	629	680,183	328,521	1,767,811
1924.....	24	7,973,261	541	612,891	268,250	1,534,193
1925.....	25	4,948,621	699	711,735	315,005	2,275,772
1926.....	31	10,636,439	780	911,424	442,998	3,069,571
1927.....	32	11,780,120	1,007	1,232,805	590,225	2,888,895
SASKATCHEWAN						
1923.....	78	4,747,582	738	760,392	65,274	1,027,971
1924.....	81	4,157,426	678	669,000	65,641	1,107,498
1925.....	68	3,732,909	652	647,014	91,025	1,055,139
1926.....	73	5,119,845	742	708,612	111,661	1,175,139
1927.....	72	5,089,410	1,112	855,704	110,961	1,432,739
ALBERTA						
1923.....	391	70,843,708	11,295	19,306,818	1,004,017	30,677,192
1924.....	387	87,003,765	8,716	13,684,225	991,549	21,750,278
1925.....	390	86,735,632	10,486	13,808,354	1,226,903	24,695,870
1926.....	425	102,875,177	10,733	14,499,210	1,380,096	26,351,728
1927.....	376	105,203,514	11,205	15,699,304	1,154,548	28,621,537
BRITISH COLUMBIA						
1923.....	153	97,357,573	12,105	19,913,678	3,682,428	37,746,729
1924.....	159	107,611,494	12,422	19,876,613	3,770,384	47,573,696
1925.....	161	107,257,567	13,727	21,440,904	4,801,665	54,160,830
1926.....	226	108,594,954	14,566	21,556,415	4,913,255	60,367,481
1927.....	282	114,129,277	15,031	22,714,957	4,966,446	58,019,829
YUKON						
1923.....	144	13,095,474	469	804,761	131,745	2,124,702
1924.....	92	24,491,850	391	666,603	117,846	785,675
1925.....	101	24,456,425	462	527,090	171,627	1,737,765
1926.....	85	6,560,124	375	578,958	254,474	1,750,600
1927.....	74	10,946,398	301	691,476	96,974	1,598,726
CANADA						
1923.....	2,295	578,637,012	66,952	91,334,877	21,257,336	194,850,548
1924.....	2,214	632,443,946	64,328	82,787,421	19,587,452	190,845,547
1925.....	2,351	632,075,145	65,090	85,103,118	20,565,800	212,531,129
1926.....	2,427	688,750,008	77,931	94,216,813	23,518,304	237,550,938
1927.....	2,350	714,073,000	84,674	104,220,892	22,960,284	251,077,661

* Includes a small production from Prince Edward Island.

Table 14.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by provinces, 1927

(a) Eastern Canada and Total for Canada

Industry	Nova Scotia	New Brunswick	Quebec	Ontario	Total for Eastern Canada	Total for Canada
METAL MINING—						
Number of firms.....	14		101	77	192	479
Capital employed..... \$	6,232,176		39,700,965	201,031,807	246,964,948	335,708,296
Number of salaried employees—						
Male.....	16		376	742	1,134	1,740
Female.....	1		32	47	80	120
Number of wage-earners.....	299		3,884	12,066	16,249	24,483
Total employees.....	316		4,292	12,855	17,463	26,343
Salaries..... \$	24,220		633,952	2,211,735	2,869,907	4,467,070
Wages..... \$	193,317		4,169,464	18,094,891	22,457,672	35,817,817
Total..... \$	217,537		4,803,416	20,306,626	25,327,579	40,234,887
Fuel and electricity purchased..... \$	47,624		1,138,503	5,119,110	6,305,237	10,411,397
Net value of products shipped..... \$	66,278		13,155,451	61,836,912	75,058,641	121,062,811
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	17	14		310	341	763
Capital employed..... \$	57,121,675	1,797,464		35,012,640	93,931,779	225,943,815
Number of salaried employees—						
Male.....	479	31		315	825	1,784
Female.....	35	4		95	134	225
Number of wage-earners.....	13,317	574		749	14,640	29,886
Total employees.....	13,831	609		1,159	15,599	31,895
Salaries..... \$	1,023,809	68,868		496,882	1,589,559	3,986,483
Wages..... \$	15,676,318	590,987		688,844	16,956,149	37,625,206
Total..... \$	16,700,127	659,855		1,185,726	18,545,708	41,611,689
Fuel and electricity purchased..... \$	2,022,574	38,347		30,013	2,090,934	3,682,870
Net value of products shipped..... \$	25,049,940	1,009,523		4,477,377	30,536,840	67,645,701
<i>Other Non-Metal Mining—</i>						
Number of firms.....	19	4	58	53	134	159
Capital employed..... \$	5,359,595	671,862	37,948,053	5,849,572	49,829,082	53,793,776
Number of salaried employees—						
Male.....	30	14	164	69	277	302
Female.....	6	3	15	18	42	46
Number of wage-earners.....	1,032	245	3,330	785	5,392	5,706
Total employees.....	1,068	262	3,509	872	5,711	6,054
Salaries..... \$	80,269	54,714	403,834	167,251	709,068	783,773
Wages..... \$	789,205	184,056	3,805,861	748,567	5,527,689	5,878,029
Total..... \$	869,474	238,770	4,209,695	915,818	6,233,757	6,661,802
Fuel and electricity purchased..... \$	97,412	29,406	1,126,949	375,145	1,628,912	1,720,027
Net value of products shipped..... \$	1,690,442	621,747	11,388,639	2,848,315	16,549,143	17,559,730
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS						
Number of firms.....	29	22	222	574	847	949
Capital employed..... \$	2,221,019	545,288	33,120,936	40,311,229	76,198,472	98,627,203
Number of salaried employees—						
Male.....	13	27	280	352	672	827
Female.....	1	1	23	64	89	108
Number of wage-earners.....	440	282	9,908	5,845	16,484	19,447
Total employees.....	463	310	10,211	6,261	17,245	20,352
Salaries..... \$	33,604	39,021	546,426	848,353	1,467,404	1,829,176
Wages..... \$	259,134	151,491	5,544,935	5,496,638	11,452,198	13,833,338
Total..... \$	292,738	190,512	6,091,361	6,344,991	12,919,602	15,662,514
Cost of fuel and electricity..... \$	116,554	57,674	2,723,470	3,118,349	6,016,047	7,145,990
Net value of products shipped..... \$	1,160,201	475,365	15,073,707	19,662,038	36,371,311	44,809,419
ALL INDUSTRIES						
Number of firms.....	78	41	351	1,014	1,514	2,350
Capital employed..... \$	70,934,465	3,014,614	110,769,954	282,205,248	466,924,281	714,073,000
Number of salaried employees—						
Male.....	538	72	820	1,478	2,908	4,653
Female.....	43	8	70	224	345	499
Number of wage-earners.....	15,082	1,116	17,122	19,445	52,765	79,522
Total employees.....	15,663	1,196	18,012	21,147	56,018	84,674
Salaries..... \$	1,161,902	162,603	1,584,212	3,724,221	6,632,938	11,066,502
Wages..... \$	16,914,220	930,288	13,520,260	25,028,940	56,393,708	93,154,390
Total..... \$	18,076,122	1,092,891	15,104,472	28,753,161	63,026,646	104,220,892
Cost of fuel and electricity..... \$	2,283,744	125,847	4,988,922	8,642,617	16,041,130	22,960,284
Net value of products shipped..... \$	27,966,861	2,106,635	39,617,797	88,824,642	158,515,935	251,077,661

Table 14.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by provinces, 1927—Concluded

(b) Western Canada

Industry	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Total for Western Canada
METAL MINING—						
Number of firms.....	4			210	73	287
Capital employed..... \$	4,653,600			73,346,260	10,743,398	88,743,258
Number of salaried employees—						
Male.....	24			565	17	606
Female.....				37	3	40
Number of wage-earners.....	147			7,809	278	8,234
Total employees.....	171			8,411	298	8,880
Salaries..... \$	65,837			1,465,845	65,481	1,597,163
Wages..... \$	319,269			12,416,381	624,495	13,360,145
Total..... \$	385,106			13,882,226	689,976	14,957,308
Cost of fuel and electricity..... \$	80,240			3,928,961	96,959	4,106,160
Net value of products shipped..... \$	3,752			44,403,729	1,596,689	46,004,170
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	2	58	348	13	1	422
Capital employed..... \$		4,046,517	99,454,563	28,307,956		132,012,036
Number of salaried employees—						
Male.....		35	685	239		959
Female.....		3	72	16		91
Number of wage-earners.....		528	9,677	5,038		15,246
Total employees.....		566	10,434	5,293		16,296
Salaries..... \$		72,860	1,693,193	630,871		2,396,924
Wages..... \$		502,351	13,254,396	6,910,810		20,669,057
Total..... \$		575,211	14,947,589	7,541,681		23,065,981
Cost of fuel and electricity..... \$		27,841	851,148	712,932		1,591,936
Net value of products shipped..... \$		846,381	26,067,724	10,192,659		37,108,861
<i>Other Non-Metal Mining—</i>						
Number of firms.....	1	3	4	17		25
Capital employed..... \$			273,286	2,292,666		3,964,694
Number of salaried employees—						
Male.....			2	11		25
Female.....			1	1		4
Number of wage-earners.....			27	179		314
Total employees.....			30	191		343
Salaries..... \$			2,940	23,584		77,705
Wages..... \$			12,799	201,764		350,340
Total..... \$			15,739	225,348		428,045
Cost of fuel and electricity..... \$			120	24,904		91,115
Net value of products shipped..... \$			12,124	474,401		1,010,587
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms.....	25	11	24	42		102
Capital employed..... \$	5,986,948	783,723	5,475,665	10,182,395		22,428,731
Number of salaried employees—						
Male.....	42	17	39	57		155
Female.....	3		7	9		19
Number of wage-earners.....	706	492	695	1,070		2,963
Total employees.....	751	509	741	1,136		3,137
Salaries..... \$	85,298	30,477	89,051	156,946		361,772
Wages..... \$	617,163	208,296	646,925	908,756		2,381,140
Total..... \$	702,461	238,773	735,976	1,065,702		2,742,912
Cost of fuel and electricity..... \$	477,638	49,376	303,280	299,649		1,129,943
Net value of products shipped..... \$	2,373,075	574,304	2,541,689	2,949,040		8,438,108
ALL INDUSTRIES						
Number of plants.....	32	72	376	282	74	836
Capital employed..... \$	11,780,120	5,089,410	105,203,514	114,129,277	10,946,398	247,148,719
Number of salaried employees—						
Male.....	77	53	726	872	17	1,745
Female.....	5	3	80	63	3	154
Number of wage-earners.....	925	1,056	10,399	14,096	281	26,757
Total employees.....	1,007	1,112	11,205	15,031	301	28,656
Salaries..... \$	199,316	106,337	1,785,154	2,277,246	65,481	4,433,561
Wages..... \$	1,033,499	749,367	13,914,120	20,437,711	625,995	36,760,682
Total..... \$	1,232,805	855,704	15,699,304	22,714,957	691,476	41,194,246
Cost of fuel and electricity..... \$	590,225	110,961	1,154,548	4,966,446	96,974	6,919,154
Net value of products shipped..... \$	2,888,895	1,432,739	28,621,537	58,019,829	1,598,726	92,561,726

Table 15—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1926 and 1927

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1926					\$	\$	\$
Nova Scotia.....	543	42	13,408	13,993	1,139,889	14,969,630	16,109,519
New Brunswick.....	69	9	1,049	1,127	172,034	780,662	952,696
Quebec.....	728	52	14,775	15,555	1,285,966	10,626,378	11,912,344
Ontario.....	1,459	209	18,392	20,060	3,629,109	23,358,526	26,987,635
Manitoba.....	61	4	715	780	137,434	773,990	911,424
Saskatchewan.....	61	4	677	742	106,867	601,745	708,612
Alberta.....	785	93	9,555	10,733	1,899,856	12,599,354	14,499,210
British Columbia.....	883	61	13,622	14,566	2,131,510	19,424,905	21,556,415
Yukon.....	22	4	349	375	61,875	517,083	578,958
Canada.....	4,611	478	72,842	77,931	10,564,540	83,652,273	94,216,813
1927							
Nova Scotia.....	538	43	15,082	15,663	1,161,902	16,914,220	18,076,122
New Brunswick.....	72	8	1,116	1,196	162,603	930,288	1,092,891
Quebec.....	820	70	17,122	18,012	1,584,212	13,520,260	15,104,472
Ontario.....	1,478	224	19,445	21,147	3,724,221	25,028,940	28,753,161
Manitoba.....	77	5	925	1,007	199,816	1,033,489	1,232,805
Saskatchewan.....	53	3	1,056	1,112	106,337	749,367	855,704
Alberta.....	726	80	10,399	11,295	1,785,184	13,914,120	15,699,304
British Columbia.....	872	63	14,096	15,031	2,277,246	20,437,711	22,714,957
Yukon.....	17	3	281	301	65,481	625,995	691,476
Canada.....	4,653	499	79,522	84,674	11,066,502	93,154,390	104,220,892

*Note on the Method of Computing the Average Number of Wage-earners for Each Industry.—If a company works only 3 months in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 3. If a second company operates every month in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 12. The average number of wage-earners for each other company in the industry is computed in the same way. The average number of wage-earners in the industry during the year is the sum of these individual averages.

Table 16—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1926 and 1927

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1926					\$	\$	\$
METAL MINING							
Alluvial Gold.....	10	2	273	285	34,089	305,752	339,841
Auriferous Quartz.....	481	23	7,159	7,663	1,398,901	10,941,722	12,340,623
Copper-Gold-Silver.....	244	15	3,144	3,403	530,079	4,016,414	4,546,493
Silver-Cobalt.....	143	13	1,623	1,779	400,403	2,415,527	2,815,930
Silver-Lead-Zinc.....	190	7	2,727	2,924	419,352	4,012,378	4,431,730
Nickel-Copper.....	21	.....	1,416	1,437	65,625	1,897,992	1,963,617
Miscellaneous.....	2	.....	23	25	2,455	8,171	10,626
Non-Ferrous Smelting and Refining.....	500	45	5,591	6,226	1,240,936	8,344,002	9,584,938
NON-METAL MINING INCLUDING FUELS							
Fuels							
Coal.....	1,390	100	26,878	28,368	3,238,520	32,603,276	35,841,796
Natural Gas.....	408	99	747	1,254	674,811	773,967	1,448,778
Petroleum.....	59	31	544	634	108,136	680,707	788,843

* See note page 30.

Table 16—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1926 and 1927—Concluded

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1926					\$	\$	\$
<i>Other Non-Metal Mining</i>							
Abrasives.....	7	1	94	102	21,190	68,879	90,069
Asbestos.....	129	12	2,656	2,797	328,813	3,215,234	3,544,097
Feldspar.....	12	1	397	410	18,450	195,121	213,571
Graphite.....	8	2	58	68	15,255	47,809	63,064
Gypsum.....	58	10	1,300	1,368	159,835	1,095,592	1,255,427
Iron Oxides.....	2	.....	43	45	3,100	35,248	38,348
Mica.....	10	2	196	208	17,668	110,601	128,269
Quartz.....	16	1	226	243	28,351	180,488	208,839
Salt.....	41	10	333	384	121,014	361,637	482,651
Talc and Soapstone.....	8	1	83	92	14,940	59,694	74,634
Miscellaneous.....	20	2	171	193	35,790	165,678	201,468
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	114	10	2,216	2,340	272,770	2,779,892	3,052,662
Clay Products.....	287	42	4,066	4,395	673,657	3,673,030	4,346,687
Lime.....	77	12	1,017	1,106	157,950	924,904	1,082,854
Sand and Gravel.....	72	8	5,592	5,672	171,018	1,386,214	1,557,232
Stone.....	212	29	4,269	4,510	411,432	3,352,294	3,763,726
Total.....	4,611	478	72,842	77,931	10,564,540	83,652,273	94,216,813
1927							
<i>METAL MINING</i>							
Alluvial Gold.....	16	3	302	321	44,195	428,401	472,596
Auiferous Quartz.....	456	31	7,535	8,022	1,417,203	11,518,516	12,935,719
Copper-gold-silver.....	325	15	3,743	4,063	612,303	4,647,792	5,260,095
Silver-Cobalt.....	105	4	1,349	1,458	285,498	1,892,665	2,178,163
Silver-Lead-Zinc.....	222	7	2,877	3,106	468,827	4,338,990	4,807,817
Nickel copper.....	27	.....	1,590	1,617	85,048	2,401,265	2,486,313
Miscellaneous.....	5	.....	60	65	2,960	20,984	23,944
Non-Ferrous Smelting and Refining.....	584	60	7,027	7,671	1,551,036	10,569,204	12,120,240
<i>NON-METAL MINING INCLUDING FUELS</i>							
<i>Fuels</i>							
Coal.....	1,328	87	28,357	29,772	3,148,677	35,807,290	39,955,967
Natural Gas.....	369	115	858	1,342	665,047	870,451	1,535,498
Petroleum.....	87	23	671	751	172,759	947,465	1,120,224
<i>Other Non-Metal Mining</i>							
Abrasives.....	10	.....	122	132	21,200	86,403	107,603
Asbestos.....	129	12	2,835	2,976	349,434	3,411,758	3,761,192
Feldspar.....	7	.....	227	234	11,643	139,910	151,553
Gypsum.....	53	10	1,364	1,427	178,976	1,132,712	1,311,688
Iron oxides.....	3	.....	45	48	3,750	34,930	38,680
Mica.....	6	3	159	168	14,622	103,883	118,505
Quartz.....	16	1	250	267	21,940	249,615	271,555
Salt.....	40	14	322	376	121,100	378,867	499,967
Talc and Soapstone.....	11	2	109	122	15,198	72,523	87,721
Miscellaneous.....	27	4	273	304	45,910	267,428	313,338
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	113	12	2,145	2,270	270,328	2,873,604	3,143,932
Clay products.....	313	47	4,416	4,776	744,367	4,024,940	4,769,307
Lime.....	83	14	1,035	1,132	168,195	965,513	1,133,708
Sand and Gravel.....	107	12	7,014	7,133	226,423	1,817,539	2,043,962
Stone.....	211	23	4,837	5,071	419,863	4,151,742	4,571,605
Total.....	4,653	499	79,522	84,674	11,066,502	93,154,390	104,220,892

* See note page 30.

Table 17—Wage-Earners in the Mineral Industry in Canada, by Months and by Classes, 1926 and 1927

Month	Metal Mining	Non-Metal Mining including Fuels			Clay Products and other Structural Materials			Total
		Fuels	Other Non-Metal-lics	Total	Clay Products	Other structural materials	Total	
1926								
January.....	19,303	29,672	3,872	33,544	1,936	4,703	6,639	59,486
February.....	19,245	27,653	4,284	31,937	1,963	5,011	6,974	58,156
March.....	19,499	25,021	4,284	29,305	2,591	5,364	7,955	56,759
April.....	19,712	25,357	4,767	30,124	3,179	6,500	9,679	59,515
May.....	19,783	25,675	5,335	31,010	4,188	8,152	12,340	63,133
June.....	20,428	26,007	5,640	31,647	4,695	13,287	17,982	70,657
July.....	20,773	26,058	5,689	31,747	4,686	13,886	18,572	71,092
August.....	21,466	27,166	5,710	32,876	4,505	9,239	13,744	68,086
September.....	21,969	28,741	5,603	34,344	3,950	8,943	12,893	69,206
October.....	22,488	30,632	5,701	36,333	3,790	8,736	12,526	71,347
November.....	21,954	31,887	5,663	37,550	3,273	7,688	10,961	70,465
December.....	21,000	32,390	5,065	37,455	2,714	5,834	8,548	67,003
*Average.....	21,956	28,169	5,557	33,726	4,066	13,094	17,160	72,842
1927								
January.....	22,153	31,636	4,457	36,093	2,376	4,946	7,322	65,568
February.....	22,076	31,055	4,383	35,438	2,251	5,494	7,745	65,259
March.....	22,138	29,231	4,674	33,905	2,754	6,289	9,043	65,086
April.....	22,432	27,431	5,156	32,587	3,400	7,406	10,806	65,825
May.....	22,645	26,698	5,977	32,675	4,421	9,493	13,914	69,234
June.....	23,476	27,444	6,132	33,576	4,808	14,701	19,509	76,561
July.....	23,325	27,970	5,852	33,822	4,920	15,292	20,212	77,359
August.....	23,777	29,047	5,903	34,950	4,765	11,323	16,088	74,815
September.....	24,000	29,962	5,836	35,793	4,443	10,917	15,360	75,158
October.....	24,012	31,312	5,655	36,937	4,075	9,442	13,517	74,496
November.....	23,493	32,625	5,292	37,917	3,664	7,858	11,522	72,932
December.....	22,692	33,141	4,994	38,135	2,990	6,290	9,280	70,107
*Average.....	24,483	29,886	5,706	35,592	4,416	15,031	19,447	79,522

* See note page 30.

Table 18—Wage-Earners in the Mineral Industry in Canada by Months and by Provinces, 1926 and 1927

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Canada
1926										
January.....	11,941	900	6,219	15,341	338	689	11,183	12,732	143	59,486
February.....	10,963	882	7,032	15,113	392	651	10,286	12,686	151	58,156
March.....	9,987	925	7,404	15,523	456	582	9,033	12,692	157	56,759
April.....	12,634	922	7,981	16,256	561	429	7,935	12,568	229	59,515
May.....	13,776	999	9,227	17,356	696	515	7,276	13,013	275	63,133
June.....	13,908	1,128	14,317	18,124	817	505	7,863	13,077	318	70,657
July.....	14,089	1,106	14,937	18,484	889	464	7,895	12,925	313	71,102
August.....	14,008	1,071	10,525	18,558	900	443	8,999	13,272	320	68,086
September.....	13,956	1,025	10,405	18,525	736	541	10,351	13,358	309	69,206
October.....	14,307	996	10,713	18,470	704	735	11,381	13,775	266	71,347
November.....	14,551	972	10,011	17,499	535	815	12,176	13,680	226	70,465
December.....	14,681	892	8,431	16,300	474	846	12,265	13,036	178	67,003
*Average.....	13,408	1,049	14,775	18,392	715	677	9,855	13,622	349	72,842
1927										
January.....	14,436	844	9,018	15,478	374	752	11,586	12,938	142	65,563
February.....	14,340	857	9,083	15,797	418	683	10,982	12,956	143	65,259
March.....	14,273	933	9,530	16,337	433	576	9,510	13,347	147	65,086
April.....	14,614	940	9,919	17,381	567	473	8,187	13,606	138	65,825
May.....	14,786	1,097	11,528	18,431	792	699	8,088	13,628	135	69,234
June.....	15,195	1,149	16,679	19,456	987	757	8,415	13,665	258	76,561
July.....	15,134	1,136	16,945	19,547	1,042	717	9,029	13,508	301	77,359
August.....	14,962	1,130	13,451	19,721	989	632	10,039	13,576	315	74,815
September.....	14,958	1,001	13,601	19,623	873	658	10,394	13,766	284	75,158
October.....	14,970	1,086	12,424	19,382	769	896	10,934	13,769	266	74,496
November.....	14,715	970	11,304	18,533	645	969	12,122	13,453	221	72,932
December.....	14,525	896	10,659	17,006	647	806	12,714	12,716	138	70,107
*Average.....	15,082	1,116	17,122	19,445	925	1,056	10,399	14,096	281	79,522

* See note page 30.

Table 19.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1926 and 1927

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 hours
1926				
By Provinces—				
Nova Scotia.....	13,086	1,421	255	112
New Brunswick.....	160	476	221	14
Quebec.....	1,894	2,455	6,120	806
Ontario.....	11,647	3,158	4,137	561
Manitoba.....	97	114	525	55
Saskatchewan.....	180	97	568	18
Alberta.....	11,459	307	651	247
British Columbia.....	14,622	170	17	3
Yukon.....	197			
Canada.....	53,302	8,198	12,494	1,816
By Industries—				
METAL MINING—				
Alluvial Gold.....		Not available		
Auriferous Quartz.....	6,823	926	89	46
Copper-Gold-Silver.....	2,618	1,042	35	10
Silver-Cobalt.....	1,215	507	6	26
Silver-Lead-Zinc.....	2,693	325	117	41
Nickel-Copper.....	1,569			
Miscellaneous.....	10	9		4
Non-Ferrous Smelting and Refining.....	5,791	458	140	2
NON-METAL MINING INCLUDING FUELS—				
Fuels—				
Coal.....	29,628	813	738	30
Natural Gas.....	209	3	55	19
Petroleum.....	172	14	56	64
Other Non-Metal Mining—				
Abrasives.....	16	30	147	
Asbestos.....	21		2,703	117
Feldspar.....	29	313	183	
Graphite.....			59	7
Gypsum.....	64	979	172	108
Iron Oxides.....			54	
Mica.....	36	123	74	
Quartz.....		26	221	6
Salt.....	141	149	8	22
Talc and Soapstone.....	14	8	69	18
Miscellaneous.....		Not available		
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	694	296	1,065	635
Clay Products.....	760	1,084	2,584	251
Lime.....	205	184	340	166
Sand and Gravel.....	93	111	413	12
Stone.....	501	798	3,166	232
Total.....	53,302	8,198	12,494	1,816
1927				
By Provinces—				
Nova Scotia.....	13,738	1,711	539	83
New Brunswick.....	172	888	241	27
Quebec.....	2,077	2,395	14,126	610
Ontario.....	12,285	4,176	5,562	543
Manitoba.....	124	190	805	156
Saskatchewan.....	115	75	1,119	25
Alberta.....	11,884	463	935	445
British Columbia.....	15,274	291	30	3
Yukon.....	169		165	14
Canada.....	55,838	10,189	23,522	1,906
By Industries—				
METAL MINING—				
Alluvial Gold.....	194	12	177	15
Auriferous Quartz.....	7,239	953	94	61
Copper-Gold-Silver.....	3,179	1,242	98	75
Silver-Cobalt.....	1,326	256	5	14
Silver-Lead-Zinc.....	3,158	79	284	56
Nickel-Copper.....	1,240	425	12	1
Miscellaneous.....		61		
Non-Ferrous Smelting and Refining.....	5,622	526	1,454	40

Table 19.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1926 and 1927—Concluded

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 10 hours
Non-Metal Mining Including Fuels—				
<i>Fuels—</i>				
Coal.....	30,437	813	1,117	51
Natural Gas.....	345	771	33	9
Petroleum.....	164	239	191	281
<i>Other Non-Metal Mining—</i>				
Abrasives.....	14	30	167	6
Asbestos.....	21		3,117	70
Feldspar.....	3	174	125	
Gypsum.....	92	1,353	344	83
Iron Oxides.....			40	16
Mica.....	58	68	54	
Quartz.....	88	55	179	
Salt.....	68	201	78	10
Talc and Soapstone.....		58	55	4
Miscellaneous.....				
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	683	489	1,013	489
Clay Products.....	1,076	1,043	3,100	154
Lime.....	224	293	627	143
Sand and Gravel.....	97	418	5,998	218
Stone.....	510	630	5,160	110
Total.....	55,838	10,189	23,522	1,906

Table 20.—Fuel and Electricity Used in the Mineral Industry in Canada, by Kinds and by Industries, 1926

Industry	Anthracite coal	Bituminous coal	Lignite coal	Coke	Gasoline and fuel oil	Gas	Wood	Other fuel	Electric power	Total value
	Tons	Tons	Tons	Tons	Imp. Gal.	Mc u. ft.	Cords	\$	K.W.H.	\$
METAL MINING—										
Alluvial Gold—										
Quantity.....					135		30		4,408,520	
\$.....					97		300		44,085	44,482
Auriferous Quartz—										
Quantity.....	990	28,193		459	1,432,177		15,747		169,287,220	
\$.....	19,997	293,298		8,573	145,524		67,910	957	1,547,152	2,083,811
Copper-Gold-Silver—										
Quantity.....	115	6,627		100	396,393		11,857		72,724,546	
\$.....	1,840	56,387		1,100	31,513		58,335	31	392,708	541,914
Silver-Cobalt—										
Quantity.....	910	9,887		93	160,928		3,893		10,929,461	
\$.....	14,630	111,941		1,141	31,438		19,518	29,433	310,806	518,907
Silver-Lead-Zinc—										
Quantity.....	64	20,976	45	499	243,515		5,753		49,395,504	
\$.....	1,064	119,735	360	3,908	126,568		58,279	24	348,741	658,679
Nickel-Copper—										
Quantity.....	3	3,190		382	30,311				32,344,297	
\$.....	48	24,853		4,369	3,912				62,439	95,621
Miscellaneous—										
Quantity.....		40							216,000	
\$.....		400							3,444	3,844
Non-Ferrous Smelting and Refining—										
Quantity.....	285	139,364		253,130	3,785,745	364,819	5,958		876,182,647	
\$.....	4,404	883,568		2,450,301	363,666	50,811	40,273		2,283,604	6,076,627
Total—										
Quantity.....	2,367	208,277	45	254,663	6,019,204	364,819	43,238		1,215,488,195	
\$.....	41,983	1,490,182	360	2,469,792	702,718	50,811	244,615	30,445	4,992,979	10,023,885
Non-Metal Mining Including Fuels										
<i>Fuels</i>										
Coal—										
Quantity.....		796,254	151,414						114,542,882	
\$.....		2,747,603	146,845						1,737,243	4,631,691
Natural Gas—										
Quantity.....		2,508			84,665	101,020			77,215	
\$.....		23,403			5,443	9,514			2,084	40,444

Table 20—Fuel and Electricity Used in the Mineral Industry in Canada, by Kinds and by Industries, 1926—Concluded

Industry	Anthracite coal	Bituminous coal	Lignite coal	Coke	Gasoline and fuel oil	Gas	Wood	Other fuel	Electric power	Total value
	Tons	Tons	Tons	Tons	Imp. Gal.	M cu. ft.	Cords	\$	K.W.H.	\$
Petroleum—										
Quantity	.....	2,544	745	.....	184,631	956,006	70	.....	1,899,769	
\$	.....	16,145	6,387	.....	9,723	23,431	280	.....	21,936	77,902
Total—										
Quantity	.....	801,306	152,159	.....	269,296	1,057,096	70	.....	116,519,866	
\$	.....	2,787,161	153,232	.....	15,166	32,945	280	.....	1,761,263	4,750,037
Other Non-Metal Mining										
Abrasives—										
Quantity	.....	663	.....	.....	.....	.....	722	.....	74,000	
\$	.....	5,150	.....	.....	.....	.....	2,611	.....	1,955	9,716
Asbestos—										
Quantity	.....	44,590	.....	2,128	.....	.....	50	.....	64,462,880	
\$	.....	282,816	.....	23,888	.....	.....	150	.....	600,860	1,012,232
Feldspar—										
Quantity	.....	935	.....	.....	7,546	.....	917	.....	.....
\$	.....	8,444	.....	.....	2,357	.....	3,853	.....	.....	14,654
Graphite—										
Quantity	.....	.....	.....	.....	30,513	.....	1,566	.....	.....
\$	.....	.....	.....	.....	5,270	.....	5,534	.....	.....	10,804
Gypsum—										
Quantity	.....	20,620	.....	483	153,448	5,080	1,305	.....	4,476,045	
\$	.....	139,432	.....	4,932	32,729	2,676	2,957	.....	58,688	241,414
Iron Oxides—										
Quantity	.....	903	.....	.....	2,980	.....	1,220	.....	171,598	
\$	.....	7,130	.....	.....	695	.....	6,315	.....	3,436	17,576
Mica—										
Quantity	.....	103	.....	.....	1,300	.....	498	.....	34,500	
\$	.....	809	.....	.....	403	.....	3,101	.....	1,040	5,353
Quartz—										
Quantity	.....	3,468	.....	30	70,452	.....	30	.....	653,000	
\$	.....	22,118	.....	300	8,385	.....	175	.....	13,333	44,311
Salt—										
Quantity	.....	54,177	2,763	.....	5,600	.....	30	.....	1,131,352	
\$	.....	280,249	19,065	.....	1,168	.....	150	6,461	17,519	324,612
Talc and Soapstone—										
Quantity	.....	493	.....	.....	310	.....	746	.....	1,400,000	
\$	.....	3,782	.....	.....	117	.....	2,610	.....	18,514	25,023
Miscellaneous—										
Quantity	.....	7,775	.....	.....	314,199	.....	632	.....	765,883	
\$	.....	43,496	.....	.....	29,329	.....	1,365	.....	5,687	79,877
Total—										
Quantity	15,397	133,787	2,763	2,641	586,348	5,080	7,716	.....	73,169,258	
\$	104,518	793,486	19,065	29,120	80,463	2,676	23,321	6,461	721,032	1,785,572
Total—										
Quantity	15,397	935,033	154,922	2,641	855,644	1,062,106	7,786	.....	189,689,124	
\$	104,518	3,580,577	172,297	29,120	95,619	35,621	29,101	6,461	2,482,295	6,535,609
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS										
Cement—										
Quantity	441	504,577	.....	49	8,784	9,274	.....	.....	169,280,187	
\$	2,016	2,664,760	.....	548	2,274	5,564	.....	.....	748,994	3,424,156
Clay Products—										
Quantity	3,250	204,111	12,186	1,976	294,540	555,136	57,967	.....	15,729,185	
\$	17,128	1,447,523	29,057	17,297	36,043	15,223	263,881	51	253,851	2,080,054
Lime—										
Quantity	1,226	63,760	35	9,948	1,088	32,613	58,932	.....	2,333,680	
\$	5,687	392,279	327	72,810	339	9,343	258,133	.....	50,072	788,990
Sand and Gravel—										
Quantity	250	18,961	.....	.....	50,357	.....	243	.....	873,980	
\$	2,754	118,833	.....	.....	12,804	.....	1,192	.....	15,653	151,236
Stone—										
Quantity	625	28,918	8	100	149,224	.....	3,981	.....	10,695,084	
\$	4,904	218,617	112	935	34,673	.....	18,114	.....	237,019	514,374
Total—										
Quantity	5,792	820,327	12,229	12,073	503,993	597,023	121,123	.....	198,912,116	
\$	32,489	4,842,012	29,496	91,590	86,133	30,130	541,320	51	1,305,589	6,958,810
Grand total—										
Quantity	23,556	1,963,637	167,196	269,377	7,408,841	2,023,948	172,147	.....	1,604,089,435	
\$	178,990	9,912,771	202,153	2,590,502	884,470	116,562	815,036	36,957	8,780,863	23,518,304

Table 21.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING						
Alluvial Gold.....	Quantity		5			
	\$		340			
Auriferous Quartz.....	Quantity	3,147	23,441	660		322
	\$	26,134	232,173	11,704		5,161
Copper-Gold-Silver.....	Quantity	3,996	10	75	3,650	80
	\$	42,052	90	1,200	23,206	1,321
Silver-Cobalt.....	Quantity		7,889	854		89
	\$		91,012	14,004		1,127
Silver-Lead-Zinc.....	Quantity	27,888	3,013	57		685
	\$	144,876	26,428	924		5,953
Nickel-Copper.....	Quantity		3,311	3		241
	\$		24,162	48		2,027
Miscellaneous.....	Quantity	64				
	\$	420				
Non-Ferrous Smelting and Refining.....	Quantity	56,575	106,514	133		229,378
	\$	384,909	650,931	2,053		2,166,276
Total.....	Quantity	91,670	144,178	1,787	3,650	230,795
	\$	598,391	1,024,796	30,273	23,206	2,181,865
NON-METAL MINING, INCLUDING FUELS						
<i>Fuels</i>						
Coal.....	Quantity	873,273		156,484		
	\$	3,040,740		111,025		
Natural Gas.....	Quantity		52			
	\$		410			
Petroleum.....	Quantity	3,561		460		
	\$	26,867		4,139		
Total.....	Quantity	876,834	52	156,944		
	\$	3,067,607	410	115,164		
<i>Other Non-Metal Mining</i>						
Asbestos.....	Quantity	21,395	18,683	14,538		1,557
	\$	157,547	137,795	98,755		18,965
Feldspar.....	Quantity		540			
	\$		4,837			
Gypsum.....	Quantity	7,533	4,925			629
	\$	46,748	38,700			5,565
Iron Oxides.....	Quantity	950		12		
	\$	7,140		192		
Mica.....	Quantity		100			
	\$		700			
Quartz.....	Quantity	146	2,848			30
	\$	1,309	18,396			275
Salt.....	Quantity		51,167			
	\$		263,009			
Talc.....	Quantity		354			
	\$		2,302			
Miscellaneous.....	Quantity	2,037	4,203	2		
	\$	12,311	27,003	30		
Natural Abrasives.....	Quantity	886				
	\$	5,940				
Total.....	Quantity	32,947	82,820	14,552		2,216
	\$	230,995	492,742	98,977		24

Industry in Canada, by Kinds and by Industries, 1927

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. Gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
1,638			992				2,201,850		2,014,730	3,814,720
1,480			6,996				22,018	30,834		58,294
44,595	28,931	1,395,938	13,445	6,902			221,866,174		9,575,633	
17,111	7,008	121,230	58,249	329		126	1,742,860	2,222,065		
68,179	3,769	191,627	11,486				59,889,657		29,691,582	
26,093	1,491	19,273	56,481				424,930	596,137		
6,480	150	84,548	2,041				17,251,738			
1,975	37	12,263	12,271			30,521	309,338	472,548		
64,999	4,912	283,870	6,367				38,988,849		11,295,285	4,539,230
27,016	1,456	76,947	39,225				265,695	588,520		78,782
520	1,554	40,173					37,351,166			
137	396	4,857					89,059	120,686		
			10							
			40					460		
28,925	4,196	5,498,852	5,875	203,038	337		1,112,907,760		262,034,688	
7,653	1,122	426,123	43,787	39,560	299	1,780	2,655,634	6,380,127		
215,336	43,512	7,495,008	40,216	299,940	337		1,490,457,194		314,611,918	8,353,950
81,465	11,150	660,693	217,049	39,889	299	32,427	5,509,534	10,411,397		137,076
6,315	1,861						24,419,359		100,303,703	2,493,785
1,979	526						404,656	3,558,926		58,513
1,620					34,659		5,820			
365					10,090		316	11,181		
4,042		22,980	112		980,267		1,591,250			
1,039		977	460		53,889		25,392	112,763		
11,977	1,861	22,980	112		1,014,926		26,018,429		100,303,703	2,493,785
3,883	526	977	460		63,979		430,564	3,682,870		58,513
	5,000						60,900,833			
	1,050						632,429	1,046,541		
5,603			1,016							
1,505			3,890					10,232		
114,833	1,914	132,039	2,025		4,036		4,074,291		86,314	
28,203	531	12,525	3,760		1,907		60,260	198,195		
1,500		160	1,383				170,306			
458		19	7,007				3,406	18,222		
865	46		461				18,000			
181	10		2,888				621	4,400		
4,316	706	78,478					399,420			
1,222	195	6,177					6,849	34,423		
		15,000	2				1,361,491			
		2,250	8			6,498	15,495	287,260		
1,483			765				1,467,700			
420			2,877				19,570	25,163		
2,177		299,956	2,064	3,533			1,477,284			
618		28,827	6,418	283		528	14,284	85,302		
			662				74,000			
			2,384				1,955	10,279		
130,777	7,666	525,633	8,378	3,533	4,036		69,943,325		86,314	
52,607	1,766	44,798	29,232	283	1,907	7,026	754,869	1,720,027		

Table 21.—Fuel and Electricity Used in the Mineral Industry

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement.....	Quantity	248,161	250,182	14,528		69
	\$	1,350,933	1,385,395	46,487		661
Clay Products.....	Quantity	30,019	187,496	1,923	16,257	2,961
	\$	203,472	1,176,044	11,857	40,161	22,626
Lime.....	Quantity	22,232	45,318	1,307		9,982
	\$	157,829	245,078	6,425		71,814
Sand and Gravel.....	Quantity	3,318	23,334		891	
	\$	25,890	134,157		2,673	
Stone.....	Quantity	6,403	24,064	950		
	\$	48,281	148,540	7,413		
Total.....	Quantity	310,133	530,394	4,180	31,676	13,012
	\$	1,786,405	3,089,214	25,695	89,321	95,101
Canada.....	Quantity	1,311,584	757,444	20,519	192,270	246,023
	\$	5,683,398	4,607,162	154,945	227,691	2,301,771

Table 22.—Fuel and Electricity Used in the Mineral

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia.....	Quantity	540,198				3,438
	\$	2,001,974				16,392
New Brunswick.....	Quantity	13,529				
	\$	68,199				
Quebec.....	Quantity	218,859	145,808	15,481		4,237
	\$	1,260,009	1,000,144	107,129		47,311
Ontario.....	Quantity		603,392	4,355		148,529
	\$		3,534,639	42,451		1,311,425
Manitoba.....	Quantity	32,699	8,244	140		
	\$	250,417	72,379	840		
Saskatchewan.....	Quantity	4,902		35,111		
	\$	38,783		46,058		
Alberta.....	Quantity	153,483		153,509		
	\$	560,914		158,427		
British Columbia.....	Quantity	347,895	543	3,650		89,814
	\$	1,501,189	4,525	23,206		926,569
Yukon.....	Quantity	19				5
	\$	1,913				74
Canada.....	Quantity	1,311,584	757,444	20,519	192,270	246,023
	\$	5,683,398	4,607,162	154,945	227,691	2,301,771

in Canada, by Kinds and by Industries, 1927—Concluded

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
5,592 1,140	1,752 371						180,083,257 761,013	3,546,000	256,300	
26,296 6,237	1,060 231	204,336 22,811	62,951 302,027	1,927 154	408,323 28,591	378	16,063,068 274,135	2,088,724	1,000	
4,552 1,114	150 34		60,058 282,855	174,736 13,979	6,500 3,900	4	1,685,056 43,404	826,436	357,645	
22,365 5,288	3,384 788	8,000 600	205 1,460				1,318,770 17,471	188,327		
114,594 27,353	5,670 1,709	65,518 5,739	4,854 22,883				13,938,544 234,585	496,503	177,260	
173,399 41,132	12,016 3,133	277,854 29,150	128,068 609,725	176,663 14,133	414,823 32,491	382	213,088,695 1,330,608	7,145,990	792,205	
531,489 158,587	65,055 16,955	8,321,475 735,618	176,774 855,966	480,136 54,305	1,434,122 98,676	39,835	1,799,505,643 8,025,375	22,960,284	415,794,140	10,847,735 195,589

Industry in Canada by Provinces, 1927

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
142,961 37,259	2,049 565	128,344 18,292	4,961 21,384	180,196 14,416		816	5,732,708 172,646	2,283,744	63,276,380	1,130,849 16,926
602 193	100 24	100 10	10,396 50,212		12,904 3,066		174,310 4,143	125,847	1,319,500	
135,217 41,390	13,582 3,758	145,932 14,174	30,418 156,790			4	808,158,560 2,358,213	4,988,922	239,608,396	
137,546 34,065	38,962 9,390	3,396,389 325,149	68,429 354,884	6,902 329	48,656 26,022	37,159	467,352,053 2,967,104	8,642,617	1,068,728	
24,168 11,123	450 293	7,760 4,345	29,803 151,984				15,190,222 98,844	590,225	2,059,000	
1,680 487		293,151 23,472	154 937				37,674 1,224	110,961	638,000	
11,201 3,266	1,861 526	22,848 944	1,625 7,663		1,372,562 69,588		32,219,019 353,220	1,154,548	11,042,349	328,897 18,026
68,055 22,606	7,551 1,981	4,216,509 294,885	30,520 102,106	293,038 39,560			468,439,247 2,047,963	4,966,446	93,874,502	5,573,269 102,343
10,050 8,198	500 418	110,442 54,347	468 10,006				2,201,850 22,018	96,974	2,907,285	3,814,720 58,294
531,489 158,587	65,055 16,955	8,321,475 735,618	176,774 855,966	480,136 54,305	1,434,122 98,676	39,835	1,799,505,643 8,025,375	22,960,284	415,794,140	10,847,735 195,589

Table 23—Fuel and Electricity Used in the Mineral Industry in Canada, by Provinces, 1926

Province	Anthra- cite coal	Bitum- inous coal	Lignite coal	Coke	Gasoline and fuel oil	Gas	Wood	Other fuel	*Electric power	Total value
	Tons	Tons	Tons	Tons	Imp. gal.	M cu. ft.	Cords	\$	K.W.H.	\$
Nova Scotia—										
Quantity	509,458			3,232	138,947	17,439	4,069		71,557,807	
\$	1,874,840			14,593	33,776	1,630	20,602	51	996,233	2,941,725
New Brunswick—										
Quantity	9,538				1,415	26,972	12,169		1,106,831	
\$	47,077				481	6,007	61,854		27,845	143,264
Quebec—										
Quantity	16,608	361,329		5,470	300,323		33,354		600,944,099	
\$	113,655	2,183,702		63,972	57,232		161,579	31	2,081,994	4,662,165
Ontario—										
Quantity	6,270	588,161	158	158,098	3,817,102	35,476	72,644		377,113,449	
\$	60,139	3,656,281	688	1,455,272	439,461	19,675	346,820	36,875	2,653,455	8,668,666
Manitoba—										
Quantity	196	33,695	35	52	12,570		19,062		12,637,679	
\$	1,215	270,152	327	2,186	5,653		91,326		72,139	442,998
Saskatchewan—										
Quantity		4,279	29,039		322,003		433		220,175	
\$		35,340	39,948		30,732		2,226		3,415	111,661
Alberta—										
Quantity		140,303	137,919		271,496	1,579,336	1,737		37,373,401	
\$		516,678	160,830		15,923	33,364	6,885		641,416	1,380,096
British Columbia and Yukon—										
Quantity	482	316,874	45	102,525	2,544,985	364,725	28,679		503,135,994	
\$	3,981	1,328,701	360	1,054,479	301,212	50,886	123,744		2,304,366	5,167,729
Canada—										
Quantity	23,556	1,963,637	167,196	269,377	7,408,841	2,023,948	172,147		1,604,089,435	
\$	178,990	9,912,771	202,153	2,590,502	884,470	116,562	815,036	36,957	8,780,863	23,518,304

* Record shows only total electricity used.

Table 24—Power Employed in the Mineral Industry in Canada, by Provinces, 1927, with Comparative Totals for 1926

Province	Steam engines and turbines	Internal comb- ustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
Nova Scotia.....No.	111	45	4	160	200	360	342	542	182
H.P.	47,458	2,580	600	50,638	5,914	56,552	28,377	34,291	44,509
New Brunswick.....No.	40	30		70	8	78	26	34	47
H.P.	2,678	279		2,967	250	3,207	478	728	2,868
Quebec.....No.	60	40	15	115	1,873	1,988	81	1,964	122
H.P.	3,475	983	51,726	56,184	93,716	149,900	2,430	96,146	6,918
Ontario.....No.	256	257	10	523	3,317	3,840	110	3,427	268
H.P.	16,377	8,132	3,487	27,996	162,329	190,325	3,596	165,925	26,553
Manitoba.....No.	16	8		24	171	195	44	216	19
H.P.	725	140		865	8,354	9,219	450	8,804	1,216
Saskatchewan.....No.	33	4		37	10	47	13	25	27
H.P.	2,180	202		2,382	73	2,455	311	384	3,030
Alberta.....No.	306	88		394	554	948	367	521	274
H.P.	36,081	1,730		37,811	21,859	59,670	10,168	32,027	32,070
British Columbia...No.	179	84	79	342	2,046	2,388	812	2,858	195
H.P.	40,066	5,305	41,485	86,856	86,251	173,107	38,466	124,717	28,415
Yukon.....No.	1	3		4	21	25	20	41	2
H.P.	100	345		445	2,515	2,960	213	2,728	115
Canada, 1927.....No.	1,002	559	108	1,669	8,200	9,869	1,825	10,025	1,136
H.P.	149,140	19,696	97,298	266,134	381,261	647,395	84,489	465,750	145,694
Canada, 1926.....No.	1,149	561	95	1,805	6,405	8,210	1,848	8,253	1,091
H.P.	147,028	15,949	96,015	258,992	339,565	598,557	86,245	425,810	134,610

Table 25—Power Employed in the Mineral Industry in Canada by Industries, 1927, with Comparative Totals for 1926

Industry	Steam engines and turbines	Internal combustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
METAL MINING—									
Alluvial Gold.... No.	5	6	7	18	21	39	1	22	4
H.P.	70	89	76	235	2,515	2,750	10	2,555	80
Auriferous Quartz No.	18	41	21	80	1,107	1,187	115	1,222	82
H.P.	1,077	6,011	6,753	13,841	57,601	71,442	5,132	62,733	7,227
Copper-Gold-Silver No.	5	23	12	40	392	432	44	436	40
H.P.	1,780	690	9,610	12,080	22,154	34,234	450	22,604	2,427
Silver-Cobalt.... No.	10	2	12	24	213	225	.....	213	20
H.P.	620	130	.....	750	8,089	8,839	.....	8,089	1,450
Silver-Lead-Zinc No.	32	33	25	90	375	465	52	427	38
H.P.	8,150	1,926	2,924	13,000	16,274	29,274	1,411	17,085	4,225
Nickel-Copper.... No.	.....	.....	.....	.....	199	199	.....	199	.....
H.P.	.....	.....	.....	.....	16,138	16,138	.....	16,138	.....
Miscellaneous.... No.	.....	.....	.....	.....	.....	.....	.....	.....	.....
H.P.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Non-Ferrous Smelting and Refining.... No.	22	4	21	47	2,344	2,391	521	2,865	37
H.P.	12,765	123	64,435	77,323	94,859	172,182	19,506	114,865	11,550
Total..... No.	92	109	86	287	4,651	4,935	733	5,354	221
H.P.	24,462	8,969	83,798	117,229	217,636	334,859	26,509	244,139	26,959
NON-METAL MINING INCLUDING FUELS—									
<i>Fuels</i>									
Coal..... No.	468	45	3	516	563	1,079	893	1,456	474
H.P.	100,653	314	12,030	112,997	20,135	133,132	52,105	72,240	85,522
Natural Gas.... No.	7	141	.....	148	5	153	15	20	6
H.P.	199	2,455	.....	2,654	30	2,684	218	248	245
Petroleum..... No.	51	60	.....	111	68	179	13	81	68
H.P.	2,018	1,346	.....	3,364	743	4,107	25	768	4,186
Total..... No.	528	246	3	775	636	1,411	921	1,567	548
H.P.	102,870	4,115	12,030	119,015	20,908	139,923	52,348	73,266	89,953
<i>Other Non-Metal Mining</i>									
Abrasives..... No.	11	1	.....	12	6	18	.....	6	11
H.P.	390	5	.....	395	241	636	.....	241	490
Asbestos..... No.	5	1	.....	6	398	404	.....	398	6
H.P.	1,120	6	.....	1,126	31,579	32,705	.....	31,579	465
Feldspar..... No.	6	4	.....	10	.....	10	.....	.....	10
H.P.	163	50	.....	213	.....	213	.....	.....	376
Gypsum..... No.	11	38	.....	49	111	160	34	145	18
H.P.	1,480	1,909	.....	3,389	4,343	7,732	569	4,912	1,630
Iron Oxides..... No.	.....	2	.....	2	4	6	.....	4	1
H.P.	.....	60	.....	60	117	177	.....	117	15
Mica..... No.	2	.....	1	3	2	5	.....	2	3
H.P.	125	.....	145	270	75	345	.....	75	100
Quartz..... No.	10	6	.....	16	17	33	15	32	6
H.P.	407	306	.....	713	575	1,288	473	1,048	585
Salt..... No.	22	4	.....	26	69	95	3	72	18
H.P.	567	440	.....	1,007	878	1,885	88	966	2,900
Talc and Soap-stone..... No.	6	5	.....	11	17	28	.....	17	4
H.P.	100	80	.....	180	683	863	.....	683	230
Miscellaneous.... No.	7	5	3	15	23	38	17	40	5
H.P.	330	184	300	814	1,059	1,873	681	1,740	260
Total..... No.	80	66	4	150	647	797	69	716	82
H.P.	4,682	3,040	445	8,167	39,550	47,717	1,811	41,361	7,051
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—									
Cement..... No.	3	9	.....	12	1,101	1,113	44	1,145	13
H.P.	158	273	.....	431	64,555	64,986	1,900	66,455	2,368
Clay Products.... No.	98	37	.....	135	416	551	3	419	109
H.P.	7,941	956	.....	8,897	15,548	24,445	69	15,617	8,637
Lime..... No.	14	5	3	22	138	160	29	167	23
H.P.	549	132	37	718	2,719	3,437	859	3,678	1,400
Sand and Gravel.. No.	66	25	5	96	78	174	6	84	36
H.P.	3,511	555	239	4,305	1,890	6,195	220	2,110	4,062
Stone..... No.	123	62	7	192	533	725	20	553	104
H.P.	4,967	1,656	749	7,372	18,461	25,833	773	19,254	5,264
Total..... No.	304	138	15	457	2,266	2,723	102	2,368	285
H.P.	17,126	3,572	1,025	21,723	103,173	124,896	3,821	106,994	21,731
Grand total 1927... No.	1,002	559	108	1,669	8,200	9,869	1,825	10,025	1,136
H.P.	149,140	19,696	97,298	266,134	381,261	647,395	84,489	465,750	145,694
Grand total 1926... No.	1,149	561	95	1,805	6,405	8,210	1,848	8,253	1,091
H.P.	147,028	15,949	96,015	258,992	339,565	598,557	86,245	425,810	134,610

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1926 and 1927

Classification	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—				
Iron ore..... ton	1,465,715	2,853,549	1,487,366	2,875,624
Pigs, Ingots, Blooms and Billets—				
Pig iron..... ton	29,246	538,032	45,833	781,832
Ferro-silicon and ferro-manganese..... cwt.	62,158	368,907	78,847	375,133
Billets, not less than 60 lb. per lineal yard..... cwt.	281,172	444,448	335,510	454,431
Other pigs, ingots, blooms and billets..... \$	55,468	220,842	73,547	278,333
Total pigs, ingots, blooms and billets..... \$		1,569,229		1,889,729
Scrap, wrought..... ton	81,639	916,857	96,463	1,172,726
Scrap, other..... ton	4,559	39,327	5,665	61,464
Castings and Forgings—				
Axles, parts and blanks..... \$		2,799,989		2,069,499
Locomotive and car wheel tires..... cwt.	150,761	659,936	236,912	1,059,423
Other castings and forgings..... \$		1,227,802		1,350,920
Total castings and forgings..... \$		4,687,727		4,479,842
Rolling Mill Products—				
Band and hoop..... cwt.	1,476,730	5,181,094	1,342,999	4,576,149
Bars and Rails—				
Railway rails..... ton	26,026	839,254	27,926	830,365
Other bars and rails..... cwt.	10,367,632	7,616,376	6,963,337	6,555,929
Plates and Sheets—				
Boiler plate..... cwt.	170,970	409,928	171,855	378,861
Canada plates..... cwt.	220,892	907,033	246,439	960,206
Tinned plates..... cwt.	1,496,750	7,819,161	1,429,053	7,504,436
Plates not less than 30 in. by ½ in., n.o.p..... cwt.	1,085,512	2,066,542	1,147,451	2,203,760
Sheets, No. 14 gauge and thinner, n.o.p..... cwt.	1,208,026	4,446,015	1,178,924	4,157,274
Galvanized, flat..... cwt.	583,441	2,549,698	454,289	1,862,804
Galvanized, other..... cwt.	2,110	8,787	2,699	10,480
Skelp, for pipe, etc..... cwt.	2,223,695	4,458,786	2,201,915	4,228,894
Other plates and sheets..... cwt.	824,457	1,880,051	734,099	1,594,781
Rods..... cwt.	941,722	1,417,475	886,060	1,202,064
Flat eye-bar blanks..... ton	3,258	134,657	37	1,433
Bridges..... \$		65,347		85,831
Other structural iron..... cwt.	4,001,622	7,910,003	4,086,297	7,959,076
Total rolling mill products..... \$		47,710,207		44,112,343
Tubes, Pipes and Fittings—				
Boiler tubes..... \$		932,828		929,311
Cast iron pipe..... cwt.	134,045	295,092	116,950	233,746
Seamless tubing, not less 3½ c. per lb..... cwt.	58,481	409,003	67,290	421,411
Other tubes, pipes, etc..... \$		2,197,914		2,142,893
Total tubes, pipes and fittings..... \$		3,834,837		3,727,361
Wire—				
Barbed fencing..... cwt.	141,615	498,281	127,644	403,937
Galvanized, No. 9, 12 and 13 gauge, not telegraph or telephone..... cwt.	244,728	613,428	250,405	660,720
Steel wire for rope..... cwt.	85,708	540,782	103,874	657,453
Wire rope, twisted wire, clothes lines, wire cable, etc., n.o.p..... \$		304,545		354,348
Other..... \$		1,172,637		1,258,093
Total wire..... \$		3,129,673		3,334,551
Chains..... \$		954,509		902,195
Engines and Boilers—				
Engines, automobile..... No.	82,361	9,580,607	107,941	12,345,198
Engines, internal combustion, other..... No.	13,684	1,550,565	13,383	1,851,553
Locomotives and parts..... No.	80	862,547	77	466,946
Other boilers, engines, etc..... \$		1,914,011		2,256,597
Total engines and boilers..... \$		13,907,730		16,920,299
Farm Implements and Machinery—				
Cream separators..... No.	21,755	904,607	18,618	698,418
Other dairy machinery..... \$		87,215		126,131
Harvesters..... No.	4,119	976,399	5,562	1,293,588
Other harvesting implements and machinery..... \$		353,632		494,417
Planting and Tillage—				
Drills and parts..... No.	4,183	534,349	6,480	882,479
Ploughs and parts..... \$		1,584,755		1,634,123
Other planting..... \$		536,423		682,585

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1926 and 1927—Continued

Classification	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—Concluded				
Farm Implements and Machinery—Concluded				
Seed Separation—				
Threshing machine separators..... No.	2,855	2,482,830	4,467	4,044,503
Threshing machine separator parts..... \$		668,352		721,952
Fanning mills..... \$	2,136	51,241	2,292	67,230
Traction engines for farm purposes—				
Not over \$1,400 each..... No.	8,392	6,233,383	15,663	12,094,706
Other..... No.	250	349,019	231	491,728
Farm tractor parts and repairs..... \$		1,264,314		1,326,129
Other farm implements..... \$		1,554,430		1,543,749
Total farm implements and machinery..... \$		17,630,949		26,101,338
Hardware and Cutlery—				
Cutlery..... \$		1,561,972		1,581,321
Hardware—				
Nails, wire..... cwt.	41,830	125,355	21,172	72,174
Other nails, spikes, tacks..... \$		39,525		33,824
Needles and pins..... \$		400,811		444,607
Nuts and bolts..... cwt.	29,381	314,712	34,857	361,052
Screws..... \$		105,793		144,987
Other hardware..... \$		1,211,894		1,376,725
Total hardware and cutlery..... \$		3,760,062		4,014,690
Machinery (Except Agricultural)—				
Sewing machines..... No.	14,727	495,905	18,923	566,356
Sewing machine parts and attachments..... \$		444,106		336,518
Washing machines, domestic..... No.	14,746	1,015,827	17,949	1,222,623
Other household machinery..... \$		146,547		197,478
Rock drills..... No.	1,084	484,171	863	443,692
Other mining and metallurgical..... \$		2,633,954		3,182,482
Office or Business—				
Adding..... No.	4,021	651,230	5,956	820,658
Typewriting..... No.	13,825	806,027	15,674	877,586
Other..... \$		589,449		665,200
Printing and Book-Binding—				
Printing presses..... \$		1,633,853		2,265,330
Typesetting machines..... \$		682,980		911,136
Other printing and bookbinding..... \$		707,205		746,496
Coke and gas machinery..... \$		255,495		312,946
Cranes and derricks..... No.	181	625,228	266	974,676
Logging equipment..... \$		1,046,401		1,166,359
Metal-working, n.o.p..... \$		2,269,651		2,901,215
Paper and pulp mill..... \$		3,763,025		3,770,179
Pumps, power, and parts..... No.	7,075	989,618	8,074	962,375
Rolling mill machines..... \$		184,327		325,310
Shovels, steam, electric or other power..... No.		503,434		811,234
Textile..... \$		3,215,861		5,077,355
Other machinery..... \$		15,539,246		17,700,550
Total machinery (except agricultural)..... \$		38,683,540		46,237,754
Springs..... \$		201,475		182,264
Stamped and Coated Products—				
Tin cans..... \$		666,281		673,173
Other..... \$		1,383,173		1,334,083
Tools and hand implements..... \$		2,336,648		2,489,459
Vehicles—				
Automobiles, freight..... No.	2,199	2,813,434	3,804	4,638,207
Automobiles, passenger..... No.	26,345	21,563,258	32,826	26,901,209
Automobile parts..... \$		27,465,642		31,852,100
Railway cars, all kinds..... No.	886	721,897	969	865,575
Railway cars, parts of..... \$		1,193,953		830,081
Other vehicles of iron..... \$		641,926		907,549
Total vehicles..... \$		54,405,110		65,497,721
Drums, tanks, cylinders..... \$		720,830		1,173,137
Furniture..... \$		568,240		836,326
Plates for agricultural implements..... cwt.	70,042	357,797	61,191	305,667
Pumps, hand..... No.	38,109	629,808	34,508	443,492
Stoves..... \$		473,288		628,022
Valves..... \$		674,036		787,104
Articles for shipbuilding..... \$		1,494,759		1,321,942
Other iron and steel..... \$		15,984,805		16,649,248
Total iron and its products..... \$		219,575,146		248,151,554

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1926 and 1927—Continued

Classification	1926		1927	
	Quantity	Value \$	Quantity	Value \$
NON-FERROUS METALS—				
Alumina and bauxite..... cwt.	1,451,455	3,118,205	2,532,353	6,036,019
Cryolite..... cwt.	64,009	369,688	24,483	164,437
Aluminium ingots, sheets..... lb.	962,417	270,517	1,114,511	331,335
Other aluminium..... \$		1,111,608		1,363,420
Brass—				
Scrap..... cwt.	26,695	265,637	29,085	270,627
Bars and rods..... cwt.	10,773	190,436	6,523	114,270
Strips, sheets, plates..... cwt.	14,247	264,193	7,847	158,742
Tubing..... lb.	2,726,066	672,435	2,765,078	627,124
Wire, plain..... lb.	487,881	126,360	453,239	113,668
Wire cloth..... \$		102,112		48,030
Other..... \$		3,262,063		3,674,838
Total brass..... \$		4,883,236		5,007,299
Copper—				
Blocks, pigs, ingots..... lb.	8,599,699	1,231,422	3,795,607	510,771
Scrap..... cwt.	30,394	408,999	58,171	737,029
Bars and rods..... cwt.	177,593	2,702,937	271,161	3,847,404
Strips, sheets, plates..... cwt.	18,824	406,988	18,367	385,477
Tubing..... lb.	2,535,798	579,044	2,124,343	506,745
Other..... \$		1,244,634		1,288,144
Total copper..... \$		6,574,024		7,275,570
Lead—				
Pigs, bars and sheets..... lb.	862,963	78,146	490,653	40,759
Other..... \$		287,726		361,271
Nickel—				
Bars, rods, sheets, etc..... lb.	1,001,247	206,466	825,715	233,366
Nickel-plated ware..... \$		1,544,420		2,194,808
Other..... \$		348,956		907,693
Precious Metals—				
Electro-plated ware..... \$		846,216		1,013,799
Silver in bars, blocks, etc..... \$		1,011,015		896,535
Other..... \$		773,670		708,061
Tin—				
Blocks, bars, pigs..... cwt.	51,079	3,263,513	48,338	3,066,082
Foil..... lb.	304,242	179,265	154,622	77,914
Other (collapsible tubes)..... \$		43,318		82,179
Zinc—				
Spelter..... lb.	1,122,640	86,779	1,355,816	89,233
Sheets and plates..... lb.	5,668,799	570,116	5,909,244	512,099
Other..... \$		216,105		311,636
Phosphor tin and bronze..... lb.	649,168	267,498	686,388	253,893
Other alloys, n.o.p..... \$		72,652		54,268
Clocks and watches..... \$		3,100,743		3,257,037
Electric Apparatus—				
Batteries, storage..... No.	39,233	773,529	28,168	593,443
Dynamos, generators..... \$		1,227,792		1,270,925
Incandescent lamps—				
Carbon filament..... No.	1,256,294	71,618	2,058,104	106,125
Metal filament..... No.	2,943,644	265,544	3,251,645	266,065
Electric light fixtures..... \$		661,508		793,910
Meters..... \$		376,181		367,800
Motors..... \$		2,386,197		2,790,957
Spark plugs, etc..... \$		629,951		761,285
Switches, etc..... \$		1,238,339		1,404,610
Telegraph instruments..... \$		165,479		237,996
Telephone instruments..... \$		765,140		873,453
Wireless apparatus..... \$		2,782,247		3,256,660
Other..... \$		5,353,566		5,875,722
Total electric apparatus..... \$		16,697,091		18,598,951
Gas apparatus..... \$		158,297		219,066
Printing materials (except machinery)—				
Stereotypes..... sq. in.	5,097,542	277,796	6,168,984	272,025
Other..... \$		117,986		107,000
Manganese oxide..... cwt.	767,440	779,303	1,397,802	1,451,370
Ores, n.o.p..... cwt.	385,009	368,018	777,769	695,248
Antimony, not ground..... lb.	1,139,748	183,127	1,284,483	143,446
Mercury..... lb.	100,492	84,910	124,099	160,830
Lamps, sidelights, etc..... \$		893,996		1,107,807
Other non-ferrous metals..... \$		1,981,199		2,201,700
Total non-ferrous metals..... \$		50,765,605		59,195,656

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1926 and 1927—Continued

Classification	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
NON-METALLIC MINERALS—				
Asbestos other than crude.....	\$	565,635		671,882
Clay and Clay Products—				
China clay.....	cwt.	360,546	420,822	235,824
Fire clay.....	cwt.	937,487	193,741	219,500
Other clays.....	\$	85,280		94,989
Bricks, building.....	M	4,157	93,337	142,438
Bricks, fire.....	\$	1,602,246		1,794,490
Brick and tile, n.o.p.....	\$	603,421		681,593
Pottery and chinaware.....	\$	4,262,227		5,043,993
Artificial teeth.....	\$	397,570		388,092
Bath tubs, etc.....	\$	371,260		501,338
Other.....	\$	386,030		535,959
Total clay and clay products.....	\$	8,196,014		9,638,216
Coal and Coal Products—				
Coal, anthracite.....	ton	4,192,419	4,107,854	31,282,371
Coal, bituminous.....	ton	12,376,606	14,065,142	29,439,815
Coal for ships' stores.....	ton		503,529	1,018,069
Coal tar, crude.....	gal.	3,618,324	3,812,637	286,307
Carbolic oil.....	gal.	4,120,712	1,336,312	276,518
Coke.....	tons	988,034	772,235	4,742,224
Lignite and coal products, n.o.p.....	\$	79,509		82,465
Total coal and coal products.....	\$	67,281,098		67,127,769
Glass and Glassware—				
Carboys, bottles, jars, etc. (including milk bottles). ..	\$	1,378,092		1,409,644
Tableware.....	\$	836,581		879,331
Incandescent lamp bulbs and tubing for.....	\$	560,395		529,162
Common window glass.....	sq. ft.	41,874,498	41,752,878	1,127,529
Plate glass—				
Not over 7 sq. ft.....	sq. ft.	3,756,968	3,779,673	1,321,243
7 to 25 sq. ft.....	sq. ft.	672,197	666,861	272,275
Other, not bevelled.....	sq. ft.	1,043,432	1,033,289	462,317
Other glass and glassware.....	\$	2,060,480		2,145,197
Total glass and glassware.....	\$	8,515,395		8,146,698
Graphite and products.....	\$	121,920		123,137
Petroleum, Asphalt and Their Products—				
Asphalt, solid.....	cwt.	393,263	404,848	856,225
Other asphalt and oil.....	\$	39,508	954,733	109,552
Crude Petroleum—				
Natural, for refining.....	gal.	570,383,547	31,338,734	684,269,831
Other, for refining.....	gal.			45,500
Other, -8235 and heavier.....	gal.	97,050,028	4,006,369	81,343,133
Fuel oil for ships' stores.....	gal.			37,870,909
Coal and kerosene oil, refined.....	gal.	4,836,242	543,455	4,028,966
Gasoline—				
Under .725 specific gravity.....	gal.	60,105,404	8,670,438	85,432,311
Other.....	gal.	22,734,284	3,288,357	22,736,017
Lubricating oil.....	gal.	10,259,878	2,968,555	11,878,647
Other oils.....	\$		178,331	303,311
Other petroleum products.....	\$		1,069,447	1,036,569
Total petroleum, asphalt and their products.....	\$	52,508,042		53,844,494
Stone and Its Products—				
Abrasives.....	\$	2,756,189		3,219,847
Building and paving stone.....	\$	497,469		499,523
Cement.....	cwt.	73,901	77,866	87,541
Silica sand.....	cwt.	3,102,172	372,488	2,976,622
Whiting.....	cwt.	339,716	204,556	318,186
Marble, slate and other.....	\$	1,838,849		1,844,456
Total stone and its products.....	\$	5,747,417		6,188,139
Miscellaneous—				
Carbons, electric.....	\$	1,065,832		1,051,810
Diamonds, unset.....	\$	3,035,724		2,754,151
Insulators, electric.....	\$	341,245		278,763
Salt.....	cwt.	4,667,260	1,036,594	5,206,329
Sulphur.....	cwt.	3,682,513	2,945,651	3,553,725
Other non-metallic minerals.....	\$	1,327,428		1,579,480
Total non-metallic minerals.....	\$	152,687,995		155,404,666

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1926 and 1927—Concluded

Classification	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
CHEMICALS AND ALLIED PRODUCTS—				
Acid, citric..... lb.	235,374	68,762	219,254	72,205
Acid, stearic..... lb.	1,032,218	133,436	1,581,578	150,764
Other acids..... \$		452,775		478,248
Alcohols, industrial..... gal.	7,078	25,046	5,245	15,785
Cellulose products..... \$		2,223,120		2,502,768
Drugs and medicinal preparations..... \$		3,100,911		2,907,266
Dyeing and Tanning Materials—				
Aniline and coal tar dyes..... lb.	2,829,451	1,792,271	2,932,189	1,693,158
Coal tar dye products, n.o.p..... lb.	642,863	124,968	451,563	101,454
Logwood, oak, quebracho extracts..... lb.	37,335,962	1,362,486	41,533,303	1,659,931
Other dyeing and tanning articles..... \$		374,433		431,620
Total dyeing and tanning materials..... \$		3,654,158		3,886,163
Explosives..... \$		415,539		563,897
Fertilizers, n.o.p.—				
Potash, muriate of..... cwt.	296,650	432,537	373,469	627,997
Soda nitrate..... cwt.	577,353	1,417,710	533,668	1,262,730
Superphosphates..... cwt.	1,538,373	925,515	1,731,777	979,261
Other..... \$		916,918		1,278,065
Total fertilizers, n.o.p..... \$		3,692,680		4,138,053
Paints, Pigments and Varnishes—				
Litharge..... cwt.	22,296	223,839	30,150	245,630
Lead, red..... lb.	1,158,873	112,915	1,844,288	125,358
Black, carbon..... lb.	5,825,935	431,864	9,599,189	637,954
Blacks, other..... lb.	1,368,712	127,751	1,841,591	135,352
Lithopone..... lb.	12,590,820	520,249	15,804,451	644,175
Oxide of cobalt, etc..... lb.	292,030	151,416	237,787	147,236
Oxides, fireproofs..... lb.	6,108,469	560,116	6,711,100	632,470
Zinc white..... lb.	13,278,306	943,724	16,665,713	1,113,573
Liquid fillers, etc..... lb.	3,123,891	526,877	3,353,232	519,837
Varnish, lacquers, etc..... gal.	131,736	290,862	103,967	201,739
Other paints, etc..... \$		488,385		561,144
Total paints, pigments and varnishes..... \$		4,377,998		4,964,468
Perfumery, Cosmetics—				
Perfumes over 4 oz..... gal.	4,682	101,733	2,718	97,702
Other..... \$		942,532		1,194,110
Soap—				
Castile..... lb.	1,343,834	109,270	1,176,528	96,772
Common laundry..... lb.	9,611,191	679,703	9,875,487	718,906
Other..... \$		410,920		373,362
Inorganic Chemicals, n.o.p.—				
Alum in bulk..... cwt.	67,395	84,072	23,892	36,650
Sulphate of alumina..... cwt.	418,878	482,811	416,490	473,366
Ammonia, nitrate of..... lb.	4,740,467	209,066	5,525,794	247,069
Sal ammoniac..... lb.	2,405,010	123,793	3,535,977	148,890
Copper sulphate..... lb.	3,609,947	170,770	4,697,121	228,249
Chlorine, liquid..... lb.	11,889,520	372,623	9,047,961	290,919
Chloride of lime..... lb.	16,148,529	278,651	16,082,908	254,222
Potash compounds..... lb.	5,752,608	519,672	5,683,993	559,057
Soda compounds..... lb.	220,756,765	3,105,912	224,837,965	3,192,925
Acid phosphate..... lb.	3,998,631	255,020	3,113,540	228,433
Other..... \$		657,783		825,106
Total inorganic chemicals, n.o.p..... \$		6,260,173		6,484,886
Other Drugs, Dyes and Chemicals—				
Glycerine..... lb.	4,351,879	887,893	2,129,761	448,437
Other chemicals and allied products..... \$		3,821,735		4,219,718
Total chemicals and allied products..... \$		31,358,384		33,313,500

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1926 and 1927

Classification	1926		1927		
	Quantity	Value	Quantity	Value	
		\$		\$	
IRON AND ITS PRODUCTS—					
Ore, including chromite.....	ton	759	7,436	2,475	12,125
Pigs, Ingots, Blooms and Billets—					
Pig Iron.....	ton	3,803	77,134	385	7,752
Ferro-manganese and ferro-silicon.....	ton	57,767	3,413,164	43,821	2,833,946
Billets, ingots and blooms.....	ton	1,254	31,092	1,138	26,658
Total pigs, ingots, blooms and billets.....	\$		3,521,390		2,868,356
Scrap iron.....	ton	64,844	646,644	77,876	782,407
Castings.....	\$		152,394		147,893
Forgings.....	\$		121,561		32,816
Rolling Mill Products—					
Bars and rods.....	ton	26,423	1,004,810	16,527	657,880
Plates and sheets.....	ton	197	17,024	197	12,624
Rails.....	ton	13,824	516,983	28,160	963,383
Structural steel.....	ton	15,348	1,147,162	3,269	295,252
Total rolling mill products.....	\$		2,685,979		1,929,139
Pipe and Tubing.....	\$		1,847,281		1,943,081
Wire—					
Barbed.....	cwt.	22,160	75,874	24,909	84,628
Woven fencing.....	\$		167,377		183,293
Other.....	\$		656,768		585,837
Engines and Boilers—					
Locomotives and parts.....	No.	1	37,254	2	49,623
Other.....	\$		264,661		155,375
Farm Implements and Machinery—					
Cream separators.....	\$		112,786		72,802
Harvesters.....	No.	14,533	2,475,378	15,528	2,586,978
Hay rakes.....	No.	2,134	73,066	1,838	65,625
Mowers.....	No.	30,781	1,851,800	24,777	1,427,523
Reapers.....	No.	2,533	246,659	681	65,457
Cultivators.....	No.	12,967	748,372	14,161	900,185
Drills.....	No.	6,084	952,470	6,806	1,105,809
Harrows.....	\$		327,584		309,560
Ploughs.....	\$		2,505,729		2,175,628
Threshing machines.....	\$		3,519,824		4,338,378
Spades and shovels.....	\$		237,577		251,714
Other.....	\$		812,648		504,849
Parts.....	\$		3,071,105		2,682,395
Total farm implements and machinery.....	\$		16,934,998		16,486,903
Hardware and Cutlery—					
Razors and razor blades.....	\$		2,365,996		1,834,168
Nails, wire.....	cwt.	72,263	260,619	66,858	238,453
Nails, other.....	cwt.	28,555	175,483	17,656	131,082
Needles and pins.....	\$		278,133		353,769
Bolts and nuts.....	cwt.	17,156	105,607	10,653	65,003
Other hardware.....	\$		259,216		285,002
Machinery—					
Electric vacuum cleaners.....	No.	23,034	976,835	35,209	1,440,477
Sewing machines.....	\$		1,928,989		3,074,148
Adding machines.....	No.	1,590	263,038	2,125	201,366
Typewriters.....	No.	388	14,940	598	27,612
Metal-working.....	\$		246,266		64,743
Wood-working.....	\$		104,859		38,173
Other machinery.....	\$		916,516		745,004
Total machinery.....	\$		4,451,443		5,591,523
Tools, hand or machine.....					
	\$		286,070		288,690
Vehicles—					
Automobiles, freight—					
One ton or less.....	No.	20,682	6,928,939	17,500	6,247,778
Over one ton.....	No.	14	28,303	14	24,348
Automobiles, passenger—					
\$500 or less.....	No.	40,689	14,403,426	24,922	9,129,675
\$500 to \$1,000.....	No.	9,695	7,252,736	10,552	7,620,366
Over \$1,000.....	No.	3,244	4,123,497	4,426	5,406,830
Total utaomobiles.....	No.	74,324	32,736,901	57,414	28,428,997

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1926 and 1927—Continued

Classification	1926		1927	
	Quantity	Value	Quantity	Value
IRON AND ITS PRODUCTS—Concluded				
Vehicles—Concluded				
Automobile parts.....	No. 1	\$ 5,485,486		\$ 3,434,465
Railway cars and parts.....	No. 8	56,954	57	213,309
Tractors and parts.....	No. 8	88,320	8	165,635
Other vehicles of iron.....	\$	202,638		90,434
Total vehicles.....	\$	38,570,299		32,332,840
Chains.....	\$	155,232		156,532
Stoves.....	\$	139,228		120,127
Other iron and steel.....	\$	1,435,219		1,172,709
Total iron and its products.....	\$	75,602,162		67,831,374
Non-Ferrous Metals—				
Aluminium—				
Scrap.....	cwt. 3,538	50,888	5,435	66,534
Bars, blocks, etc.....	cwt. 251,770	5,900,547	519,024	10,544,195
Manufactures.....	\$	1,188,260		403,230
Brass—				
Old and scrap.....	cwt. 60,714	536,889	72,964	584,725
Valves.....	\$	161,899		248,385
Other.....	\$	154,967		515,902
Copper—				
Fine, in ore, matte, regulus.....	cwt. 671,083	7,822,260	728,412	7,371,542
Blister.....	cwt. 452,563	6,055,266	542,588	6,667,270
Old and scrap.....	cwt. 59,724	614,108	59,125	602,494
Bars.....	cwt. 2,569	72,475	2,481	63,165
Wire, insulated.....	\$	380,311		199,817
Other.....	\$	64,439		48,491
Total copper.....	\$	15,008,859		14,952,779
Lead—				
In ore.....	cwt. 136,449	796,412	130,326	844,637
Pig.....	cwt. 2,025,103	12,983,907	2,394,091	11,981,388
Nickel—				
In matte.....	cwt. 391,774	6,074,497	364,588	5,784,623
Nickel oxide.....	cwt. 246,984	51,961		1,600,986
Fine.....	cwt. 246,984	6,386,387	290,158	7,896,211
Precious Metals—				
Gold-bearing quartz, dust, etc.....	\$	7,340,451		7,881,512
Silver in ore, concentrates, etc.....	Oz. 5,890,280	3,546,952	5,445,117	2,894,386
Silver bullion.....	Oz. 15,241,853	9,559,825	15,970,961	8,995,040
Other.....	\$	420,939		404,530
Total precious metals.....	\$	20,868,167		20,175,468
Zinc—				
Ore.....	ton 41,917	1,393,165	25,227	862,498
Spelter.....	cwt. 960,081	7,107,876	1,124,204	6,826,808
Scrap, dross and ashes.....	cwt. 31,873	114,015	58,771	178,562
Miscellaneous—				
Electric apparatus.....	\$	1,694,705		1,725,835
Cobalt ore.....	ton 373	192,400	683	242,741
Cobalt, metallic.....	lb. 176,643	347,837	354,908	707,709
Ores, n.o.p.....	ton 508	116,894	133	3,163
Other non-ferrous metals.....	\$	931,068		910,766
Total non-ferrous metals.....	\$	82,009,639		87,057,150
Non-Metallic Minerals—				
Asbestos.....	ton 141,760	8,669,810	133,225	8,697,376
Asbestos sand.....	ton 136,231	1,992,480	130,065	2,037,935
Asbestos mfrs.....	\$	43,011		66,334
Porcelain insulators.....	\$	120,823		155,196
Other clay and products.....	\$	104,093		127,516
Coal (incl. lignite).....	ton 1,028,200	5,739,436	1,113,330	5,890,259

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1926 and 1927—Concluded

Classification	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
Non-METALLIC MINERALS—CON.				
Coal Products—				
Cinders.....	\$	23,006		16,218
Coke.....	ton 61,245	788,166	91,533	892,641
Tar.....	4,642,453	374,395	2,914,642	277,793
Glass and glassware.....	\$	214,896		128,958
Graphite.....	cwt. 51,276	180,851	33,989	102,476
Mica splittings.....	cwt. 6,313	432,345	3,189	213,651
Other mica.....	\$	66,897		113,195
Petroleum and its Products—				
Petroleum, crude.....	gal. 21,043,135	851,750	18,793,254	923,948
Kerosene, refined.....	gal. 1,584,645	192,988	1,759,838	191,533
Gasoline and naphtha.....	gal. 3,887,536	773,958	2,463,379	431,011
Other oil.....	gal. 961,577	200,562	258,251	81,147
Wax.....	cwt. 10,682	62,329	3,609	21,327
Stone and its Products—				
Abrasives, artificial.....	cwt. 1,055,592	2,908,320	1,000,321	2,645,347
Grindstones.....	\$	75,374		50,866
Gypsum, crude.....	ton 668,064	1,069,123	588,808	959,858
Lime.....	cwt. 374,233	344,616	421,382	367,939
Cement, portland.....	cwt. 1,000,762	358,231	873,929	308,144
Feldspar.....	ton 33,016	251,551	28,648	225,955
Sand and gravel.....	ton 907,935	278,278	637,627	177,999
Talc, refined.....	cwt. 216,468	125,633	213,830	125,123
Other.....	\$	399,422		346,933
Other non-metallic minerals.....	\$	452,939		766,671
Total non-metallic minerals.....	\$	27,095,282		26,343,349
CHEMICALS AND ALLIED PRODUCTS—				
Acid, acetic.....	cwt. 221,770	2,089,339	277,531	2,860,393
Acid, sulphuric.....	cwt. 562,731	320,324	348,142	191,926
Acids, other.....	cwt. 16,918	11,694	3,084	9,805
Wood alcohol.....	gal. 37,196	33,835	47,026	49,083
Other industrial spirits.....	\$	176,468		15,321
Drugs, medicinal.....	\$	567,953		487,904
Dyeing and tanning materials.....	\$	1,342		1,721
Explosives.....	\$	113,415		179,738
Fertilizers—				
Ammonium sulphate.....	cwt. 327,644	813,115	338,935	730,815
Cyanamid.....	cwt. 1,658,687	3,823,628	2,217,349	4,623,461
Other mfd., n.o.p.....	cwt. 21,812	27,573	21,484	25,306
Paints, pigments and varnishes.....	\$	502,183		428,548
Soap, toilet.....	lb. 3,975,521	741,514	5,283,306	811,000
Soap, n.o.p.....	lb. 452,474	41,747	493,077	40,258
Inorganic Chemicals, n.o.p.—				
Arsenic, n.o.p.....	cwt. 33,430	108,120	38,566	124,823
Acetate of lime.....	cwt. 55,317	161,150	70,725	232,630
Calcium carbide.....	cwt. 445,861	1,717,780	268,376	913,498
Soda and sodium compounds.....	cwt. 572,934	3,420,841	732,026	3,889,640
Cobalt oxide and salts.....	lb. 293,369	494,678	379,136	668,788
Other.....	\$	118,736		109,300
Total inorganic chemicals, n.o.p.....	\$	6,021,305		5,938,679
Creosote oil.....	gal. 1,773,268	302,976	3,472,566	588,663
Glycerine.....	cwt. 6,229	104,758	9,362	136,237
Other drug s, dyes and chemicals.....	\$	794,353		736,057
Total chemicals and allied products.....	\$	16,487,522		17,854,915

Table 28.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1927.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	\$	\$	\$	\$	\$	\$	\$	\$
BRITISH EMPIRE								
United Kingdom.....	17,462,546	8,921,710	5,835,981	16,061,756	14,567,830	2,234,953	4,347,931	3,926,063
Irish Free State.....		27,388	189	6,919	303	682,400	365	23,577
Aden.....		21,926						
Africa—								
British East.....		896,987		5,383				398
British South.....	365	2,438,449		184,207	12,600	136,303		19,813
British West.....								
Gambia.....		5,614						
Gold Coast.....		288,282	1,340,465					6,536
Nigeria.....		158,063		757				
Sierra Leone.....		23,005				7,794		
Other Br. W. Africa.....		21,810						
Bermuda.....	65	16,699	90	3,945	3	20,870		20,841
Br. East Indies—								
British India.....	134	5,609,093	14,603	3,599,143	18,833	17,821	5,533	75,554
Ceylon.....	80	506,446		9,539				4,284
Straits Settlements.....		879,631	397,682	26,588		521	2,193	1,188
Other Br. East Indies.....		1,519		1,305			2,097	
British Guiana.....	33,382	87,460	2,275	5,580		60,641		44,369
British Honduras.....	9,810	29,926		1,209		4,380		7,794
British Sudan.....		21,010		800				
Br. West Indies—								
Barbados.....	11,965	92,508	1,841	5,950	97	7,616		61,249
Jamaica.....	2,245	628,271		3,539		36,881	6,997	63,565
Trinidad and Tobago.....	20,796	263,087		35,777		20,898		69,447
Other Br. West Indies.....	29,375	138,168	934	2,058	76,190	23,537	775	50,454
Gibraltar.....		956			18	4,740		
Hong Kong.....	1,435	40,731	1,411	262,487	8,229	245	80,024	131,461
Iraq (Mesopotamia).....		221,739						68
Malta.....		122,040		370				
Newfoundland.....	495,299	1,079,123	3,990	141,175	110,749	2,103,851	2,837	477,751
Oceania—								
Australia.....	20,283	5,997,489	3	346,258	347	320,316	1,071	195,868
Fiji.....		60,399	27	1,312		218		207
New Zealand.....	427	3,094,903	36	554,927	140	288,746	80	121,400
Other Oceania.....		18,584		460		79		
Palestine.....		8,700	513		18			
Total British Empire.....	18,088,207	31,721,716	7,600,040	21,261,444	14,795,357	5,972,810	4,449,903	5,301,887
FOREIGN COUNTRIES								
Argentina.....	412	6,847,547		59,792		9,253	436,628	16,063
Austria.....	27,485	22,035	92,366	1,651	18,239		14,111	
Belgium.....	2,659,038	301,027	193,097	2,283,286	3,004,315	630,499	338,667	135,442
Bolivia.....		74,934		862				173
Brazil.....		2,609,625		203,998		35,511		1,101
Bulgaria.....		31,760						
Chile.....		747,941		15,607		9	473,154	41,115
China.....	4,637	333,158	46,114	4,141,604	5,973	16,066	19,176	89,155
Colombia.....		559,430		38,815	5,840,008	54,759		11,800
Costa Rica.....		117,034				146		7,892
Cuba.....		129,740		120,791	133	8,139		260,774
Czecho-Slovakia.....	71,460	34,189	75,498		662,614	8,475	5,550	
Denmark.....	17,048	1,600,963	20,006	13,267	3,417	24,247	3,368	100
Ecuador.....		59,879		729	506,997	1,726		30
Egypt.....	841	579,272	313			2,040		50
Estonia.....		1,779						
Finland.....	53,736	163,311	92		16,636	2,597	13,335	
France.....	679,559	2,163,153	466,877	530,320	552,499	444,738	1,162,758	11,185
French Africa.....	89,983	194,405	25			82,239		59
French West Indies.....		15,042				4,781		21,512
St. Pierre and Miquelon.....	28	24,541	269	3,662		78,015		8,854
Germany.....	2,276,725	1,237,011	1,151,669	2,580,843	1,357,317	1,509,294	3,063,050	19,421
Greece.....	5	10,660			145	12,264		
Guatemala.....		71,911		981		2,881		1,477
Hayti.....		62,967		657				296
Honduras.....		4,151				7,570		41,863
Hungary.....	11	31,986		9,113			140	
Italy.....	20,054	158,880	80,073	527,141	152,582	362,090	82,072	
Japan.....	8,137	746,049	321,911	6,833,646	547,942	455,804	92,307	595,500
Korea.....		5,510	1,189	11,665	18			16,390
Jugo-Slavia.....		122,657		189				
Mexico.....		108,265		153,596	479,547	79,354		1,676,417
Morocco.....		128,102	115		44	1,296		
Netherlands.....	74,962	253,268	60,036	4,742,766	1,080,753	290,672	632,614	1,440
Dutch East Indies.....		1,531,849	52	39,539	16,960	1,191	730	33,727
Dutch Guiana.....		1,885	12,729	303	680			625
Dutch West Indies.....		39,529		14,424	549,755	1,958		1,532

Table 28.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1927.—Concluded.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	\$	\$	\$	\$	\$	\$	\$	\$
FOREIGN COUNTRIES—Con.								
Nicaragua.....		21,873						4,158
Norway.....	61,095	275,388	4,524	218,058	17,844	188,541	92,032	22
Panama.....		536,563		455		3,340		5,027
Paraguay.....		61,234					65,718	
Persia.....		31,463				158		
Peru.....		342,589		10,139	4,535,567	23,418		12,193
Poland and Danzig.....	2,313	42,994	115	1,137				
Portugal.....		21,658	61		2,414	3,791		144
Azores and Madeira.....		125		1,948	84			
Portuguese Africa.....		250,258		125		984		481,012
Roumania.....		725,118		2,025				
Russia.....		958,282		1,101,546				
Salvador.....		35,458				108		13,080
San Domingo.....		28,729		19		24		13,067
Siam.....		200,694		517				
Spain.....	28	185,621	104,627	114,005	46,640	56,926	2,797	38,220
Canary Islands.....		73,895						
Sweden.....	1,237,805	375,225	132,585	349	39,297	41,054	49,844	
Switzerland.....	39,334	83,185	1,468,871	11,017	10,998	483	264,741	102
Syria.....	466	12,996	1,266		97		14	
Turkey.....	531	53,060	175				26,273	
United States.....	222,729,335	9,638,867	47,378,551	11,995,410	121,155,686	15,668,200	22,022,946	8,834,844
Alaska.....	8,215	1,701	208		2,930	235,838	108	553
Hawaii.....	4	4,898	202		473	173		26
Philippine Islands.....		2,459		642		5,866		1,350
Porto Rico.....		480,836		594		5,006		72,904
Uruguay.....		469,365		7,923		2,349	1,096	9,364
Venezuela.....		69,090		550		6,824	302	72,901
Other Foreign Countries.....	50				547			127
Total Foreign Countries.....	230,063,347	36,109,658	51,595,616	65,795,706	140,609,309	20,370,539	28,863,597	12,553,028
Grand Total.....	248,151,554	67,831,374	59,195,656	87,057,150	155,404,666	26,343,349	33,313,500	17,854,915

UNITED STATES TARIFF RATES ON MINERAL PRODUCTS IMPORTED

Since Canadian producers of mineral products market a large part of their annual output in the United States it was thought it might be of value to readers of this report to have at hand a guide to *United States Tariff* and the following tables were therefore compiled. These have been checked by the *Customs Division* of the *United States Treasury Department* at Washington, D.C., U.S.A.

Table 29—United States Tariff

Item Number	Material	Duty
(a) On Metals and Manufactures of		
1508	Antimony ore.....	Free
1547	Chromite—Chromite or chrome ore.....	Free
1550	Cobalt metal and ore.....	Free
29	Cobalt linoleate.....	10c. per lb.
29	Cobalt, oxide of.....	20c. per lb.
29	Cobalt salts and compounds (all other).....	30% ad val.
29	Cobalt sulphate.....	10c. per lb.
1457	Cobalt ore waste.....	10% ad val.
1556	Copper ore, regulus of, and black or coarse copper, and cement copper, old copper, fit only for re-manufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs not manufactured or specially provided for.....	Free
1557	Copper sulphate or blue vitriol, copper acetate and subacetate.....	Free
381	Copper in rolls, rods or sheets.....	2½c. per lb.
	Engraver plates, not ground and seamless copper tubes and tubing.....	7c. per lb.
	Engravers plates, ground, and brazed copper tubes.....	11c. per lb.
	Brass rods, sheet brass, brass plates, bars, and strips, Muntz or yellow metal sheets, metal sheathing, bolts, piston rods and shafting.....	4c. per lb.
	Seamless brass tubes.....	8c. per lb.

Table 29—United States Tariff—Continued

Item Number	Material	Duty
(a) On Metals and Manufactures of—Concluded		
	Brazed brass tubes, angles and channels.....	12c. per lb.
	Bronze rods and sheets.....	4c. per lb.
	Bronze tubes.....	8c. per lb.
1529	Bullion gold or silver.....	Free
1634	Gold ores and sweepings.....	Free
1597	Iron ore including manganiferous iron ore and residuum from burnt pyrites.....	Free
1677	Sulphur in any form, and sulphur ore, and spent oxide of iron containing more than 25 per centum of sulphur.....	Free
392	Lead bearing ores and mattes—duty applied on lead contents, such duty shall not be applied to the lead contained in copper mattes unless actually recovered.....	1½c. per lb.
393	Lead bullion or base bullion, lead in pigs and bars, dross, reclaimed lead, scrap lead, antimonial lead, antimonial scrap lead, type metal, Babbitt, solder and all other combinations not specially provided for, duty to apply on lead contents.....	2½c. per lb.
47	Lead in sheets, pipe, shot, glazier's lead and lead wire.....	2½c. per lb.
74	Lead, linoleum of.....	30% ad val.
302	Lead litharge.....	2½c. per lb.
302	Manganese ore or concentrates containing in excess of 30 per centum of metallic manganese.....	1c. per lb. on metallic manganese content.
302	Molybdenum ore or concentrates.....	35c. per lb. on metallic molybdenum content.
302	Tungsten ore or concentrates.....	45c. per lb. on metallic tungsten content.
1634	Nickel mattes and ores of nickel.....	Free
300	Nickel oxide.....	1c. per lb.
390	Nickel and nickel alloys in pigs, ingots, shot, cubes and similar forms.....	3c. per lb.
390	Nickel in bars, rods, sheets, strips, tubing, etc.....	25% ad val.
390	In addition thereto on the foregoing if cold rolled, drawn or worked.....	10% ad val.
1596	Platinum, palladium and other metals of the platinum group.....	Free
394	Zinc-bearing ore of all kinds containing less than 10 per centum of zinc.....	Free
	Containing more than 10 per centum of zinc and less than 20 per centum.....	½c. per lb. on metallic zinc content.
	Containing more than 20 per centum of zinc and less than 25 per centum.....	1c. per lb. on metallic zinc content.
	Containing 25 per centum of zinc or over.....	1½c. per lb. on metallic zinc content.
395	Zinc in blocks, pigs or slabs and zinc dust.....	1½c. per lb.
395	Zinc in sheets.....	2c. per lb.
395	Zinc scrap for re-manufacturing.....	1½c. per lb.
(b) On Non-Metallic Minerals		
1619	Actinolite—crude, classified as "minerals, crude, not specially provided for".....	Free
214	Actinolite—ground, classified as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
1513	Arsenic—white or arsenious acid.....	Free
1512	Arsenic—Sulphide of.....	Free
379	Arsenic—Metallic.....	6c. per lb.
1515	Asbestos—crudes, fibres, sand.....	Free
1401	Asbestos—yarn.....	30% ad val.
69	Barytes—ore, crude.....	\$4 per ton
69	Barytes—ore, ground.....	\$7.50 per ton.
	Calcite—not mentioned by this name in the tariff. Chalk, crude, is free (Item 1545) and chalk, ground, is dutiable at 25% ad valorem (Item 20).	
1570	Corundum—ore.....	Free
1415	Corundum—ground.....	1c. per lb.
1619	Feldspar—crude, classified as "minerals, crude not specially provided for".....	Free
214	Feldspar—ground, dutiable as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
207	Fluorspar.....	\$5.60 per ton
213	Graphite or plumbago—crude or refined—amorphous.....	10% ad val.
213	Graphite or plumbago—crude or refined—crystalline lump, chip or dust.....	20% ad val.
213	Graphite or plumbago—crude or refined—crystalline flake.....	1½c. per lb.
236	Grindstones—finished or unfinished.....	\$1.75 per ton
1643	Gypsum—crude.....	Free
205	Gypsum—ground.....	\$1.40 per ton
75	Iron oxides—others, crude.....	½c. per lb.
75	Iron oxides—others, washed or ground.....	½c. per lb.
75	Iron oxides—"iron-oxide pigments not specially provided for".....	20% ad val.
204	Magnesite—crude.....	1½c. per lb.
204	Magnesite—caustic calcined.....	1½c. per lb.
204	Magnesite—dead burned and grain.....	½c. per lb.
50	Magnesium sulphate—(Epsom salts).....	2½c. per lb.
208	Mica—unmanufactured, valued at not above 15 cents per pound.....	25% ad val.
208	Mica—unmanufactured, valued above 15 cents per pound.....	30% ad val.
208	Mica—cut or trimmed, and mica splittings.....	20% ad val.
208	Mica—ground.....	10c. per gal.
808	Mineral waters.....	Free
1640	Phosphate—"phosphates, crude".....	Free
1677	Pyrites—"sulphur ore, such as pyrites or sulphuret of iron in its natural state, and spent oxide of iron, containing more than 25% of sulphur".....	Free

Table 29—United States Tariff—Concluded

Item Number	Material	Duty
(b) On Non-Metallic Minerals—Concluded		
83	Salt—in bags, sacks, barrels, or other packages.....	11c. per cwt.
83	Salt—in bulk.....	7c. per cwt.
83	Sodium sulphate—crystallized or Glauber's salt.....	\$1.00 per ton
1667	Sodium sulphate, crude or salt cake.....	Free
207	Silica—crude, not specially provided for.....	\$4 per ton
207	Silica—for use as pigment, not specially provided for.....	\$7.50 per ton
209	Talc—crude.....	1c. per lb.
209	Talc—ground, washed, powdered, or pulverized (except toilet preparations).....	25% ad val.
1675	Tripoli—crude or manufactured, not specially provided for.....	Free
(c) On Structural Materials and Clay Products		
Clay Products—		
201	Brick—bath, chrome and fire, n.s.p.f.....	25% ad val.
	Magnesite brick.....	1c. per lb. and 10% ad val.
1536	Brick—not specially provided for.....	*Free
207	China clay or Kaolin.....	\$2.50 per ton
207	Clays or earths, unwrought or unmanufactured, including common blue clay and Gross-Almerode glass pot clay, n.s.p.f.....	\$1.00 per ton
207	Clays or earths, wrought or manufactured, n.s.p.f.....	\$2.00 per ton
210	Earthenware—common yellow, brown or gray made of natural, unwashed, and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing not ornamented, incised, or decorated in any manner.....	15% ad val.
210	Earthenware—common yellow, brown, or gray earthenware made of natural, unwashed and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing not ornamented, incised, or decorated in any manner and manufactures wholly or in chief value of such ware, n.s.p.f.....	20% ad val.
210	Earthenware—Rockingham.....	25% ad val.
203	Lime—n.s.p.f., including weight of container.....	10c. per cwt.
203	Lime—hydrated, including weight of container.....	12c. per cwt.
237	Slates—slate chimney pieces, mantles, slabs for tables, roofing slates, and all other manufactures of slate, n.s.p.f.....	15% ad val.
Stone—		
203	Limestone—(not suitable for use as monumental or building stone) crude, or crushed but not pulverized.....	5c. per cwt.
235	Limestone, freestone, granite, sandstone, lava and all other stone suitable for use as monumental or building stone, except marble, breccia, and onyx, n.s.p.f., hewn, dressed, or polished, or otherwise manufactured.....	50% ad val.
235	Unmanufactured, or not dressed, hewn or polished.....	15c. per cubic ft.
232	Marble, breccia and onyx, in block, rough or squared only.....	65c. per cubic ft.
232	Marble, breccia and onyx, sawed or dressed, over two inches in thickness.....	\$1.00 per cubic ft.
232	Marble, breccia and onyx slabs and paving tiles, containing not less than four superficial inches, if not more than one inch in thickness.....	8c. per superficial foot
	If more than one inch and not more than one and one-half inches in thickness.....	10c. per superficial foot
	If more than one and one-half inches and not more than two inches in thickness.....	13c. per superficial foot
	If rubbed in whole or in part.....	3c. per superficial foot in addition.
	Mosaic cubes of marble, breccia, or onyx, not exceeding two cubic inches in size, if loose.....	One-fourth of one cent per lb. and 20% ad val.
	If attached to paper or other material.....	5c. per superficial foot and 35% ad val.
1675	Stone and sand: burrstone in blocks, rough or unmanufactured; quartzite; traprock; rottenstones; tripoli and sand, crude or manufactured; cliff stone; freestone; granite and sandstones; unmanufactured, and not suitable for use as monumental or building stone; all of the foregoing n.s.p.f.....	Free

*Except on imports from countries which impose a duty on similar products imported from U.S. On imports of these commodities a corresponding duty is levied.

ACCIDENTS IN THE MINERAL INDUSTRY IN CANADA

Statistics relating to fatal and non-fatal accidents in the Canadian mineral industry during 1927 were obtained from the several provincial governments and workmen's compensation boards. The total number of accidents occurring during 1927 as thus reported was 7,494, of which 139 were fatal. Coal mining accounted for a considerable proportion of the casualties; 69 fatal and 3,719 non-fatal accidents were recorded for this industry.

Table 30.—Accidents in the Mining Industry in Canada, 1927

Cause of Accident	Nova Scotia		New Brunswick		Quebec		Ontario		Manitoba		Saskatchewan		Alberta		British Columbia		Canada	
	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal
UNDERGROUND—																		
Falls of roof or face.....	18	647	1	57	8	91	10	560			2	5	12	52	8	289	59	1,701
Mine cars and locomotives.....	8	343		42		27	2	164				17	6	62	3	212	19	867
Gas and dust explosions.....		3										1			2		2	4
Explosives.....				8	4			1	20				2		6	2	16	52
Electricity.....	1	2				1										1	1	4
Miscellaneous.....	2	980		124	3	204	6	810				14	4	43	6	858	21	3,033
Total.....	29	1977	1	231	15	323	19	1554			2	37	24	163	21	1376	111	5,661
SURFACE—																		
Haulage and cars.....		44			4	21	4	52					1	8	1	77	10	202
Machinery.....		41			3	22		78						4	1	24	4	169
Miscellaneous.....		235		14	3	50	7	630					1	16	3	378	14	1323
Total.....		320		14	10	93	11	760					2	28	5	479	28	1,694
Grand Total.....	29	2297	1	245	25	416	30	2314			2	37	26	191	26	1855	139	7,355

CHAPTER TWO

The Provinces

NOVA SCOTIA

Because of the geographical position of Nova Scotia on the Atlantic seaboard, this province was among the first in Canada to have its mineral resources explored. This was done by Master Simon, a mining engineer who, with the famous explorer Champlain, accompanied a French colonizing expedition under de Monts. Master Simon reported a discovery, in 1604, of iron and silver in St. Mary's bay and native copper at Cape d'Or. The first mention of coal, though it was no doubt known to exist before, was made by Nicolas Denys in his *Description and Natural History of Acadia* published in 1672. This in fact was the first mention of coal on the North American continent. Denys also noted the existence of gypsum or "plaister" on the Antigonish river, on the Bras d'Or lakes, at St. Ann's bay and at Mabou. Coal and gypsum mining are still the two most important mining industries of the province.

Protective tariff provisions designed to promote the coal-mining industry in Nova Scotia were made in 1877, when a duty was placed on American soft coal entering Canada; this made it possible for the Nova Scotia mine operators to compete with United States producers successfully in the markets along the St. Lawrence river. With the advent of the steel industry, using the iron ore from Newfoundland, the consumption of coal was further increased.

Gold was discovered in Nova Scotia about the year 1860, and the auriferous area has been variously estimated to represent from 3,000 to 5,000 square miles. Considerable work has been done on these gold ores, many of which contain arsenic, but of late there has not been much to report except that in the year 1923 when the price of arsenic was high, production was stimulated for a time.

In addition to coal, gypsum and gold, Nova Scotia also produces some arsenic and silver barytes, grindstones, diatomite, quartz, salt, silica brick, clay products, lime, sand and gravel and stone.

Since the year 1785 the total coal production of Nova Scotia has amounted to 225,167,634 short tons valued at \$569,363,103.

Coal produced from 40 Nova Scotia mines in 1927 amounted to 7,071,876 short tons valued at \$27,194,671 and represented 90 per cent of the total value of the mineral production of the province. This was a greater tonnage than had been produced in any previous year since 1915 and was nearly double the output of 3,842,978 short tons mined in 1925 when a strike extending over about four months very materially reduced the output. Exports of coal through Nova Scotia ports in 1927 amounted to 529,967 short tons, while imports during the same period included 29,522 tons of anthracite and 37,155 tons of bituminous coal from the United States and 29,864 tons of anthracite from Great Britain. In 1926 exports totalled 559,546 tons and imports of all grades from the United States, Great Britain, Germany and the Netherlands totalled 76,978 tons.

There were 14 mines producing gypsum in 1927 and the output amounted to 829,438 tons valued at \$1,512,015 as against 678,107 tons valued at \$1,187,918 in 1926. Forty-six per cent of the total value of all the gypsum produced in Canada in 1927 was derived from the mines of Nova Scotia. The major portion of the gypsum quarried was shipped as crude material to the United States where it is in demand.

Gold output amounted to 3,151 fine ounces being nearly double the production of 1926. There were also gains over 1926 in the production of arsenic salt, diatomite, clay products, lime, and sand and gravel, but the outputs of barytes, grindstones, quartz, silica brick and stone were less than during the previous year.

Capital invested in the Nova Scotia mining industry in 1927 amounted to \$70,934,465 of which \$59,242,762 represented the cost of land, buildings, machinery and tools, \$4,217,708 the cost of supplies and stocks on hand and \$7,473,995 the cash, trading and operating accounts.

In 1926 this total stood at \$60,312,087, the cost of the lands, buildings, etc., being \$50,760,319, supplies and stocks on hand \$3,238,418, and the cash, trading and operating accounts, \$6,313,350. Of the 1927 total, 80·5 per cent was invested in coal mining, 8·6 per cent in gold mining, 6 per cent in gypsum mining, 1·5 per cent each in clay products plants and stone quarries, and the remainder in barytes, grindstones, quartz, salt, lime and silica brick.

There were 15,663 people employed in the mining industry of Nova Scotia in 1927 of whom 581 were on salary receiving \$1,161,902 and 15,082 were wage-earners who were paid \$16,914,220. Coal mining accounted for 13,831 employees, gypsum mining gave work to 968, clay products plants engaged 206 people, gold mining used 262 men on the surface and underground, and the other mining operations accounted for the remainder.

Fuel and electricity purchased by the different mining industries cost \$2,283,744 including \$2,001,974 for bituminous coal, and \$172,646 paid for electric power, in addition to which a large amount of electric power was made by different companies for their own use, and for which no value was given. Small amounts of coke, fuel oil, gasoline and wood were also used.

Primary power equipment in use consisted of 111 steam engines, 45 internal combustion engines and 4 hydraulic turbines with a total rating of 50,638 h.p. There were 542 electric motors with a total horse power of 34,291; of these 200 were operated by purchased power and 342 by power generated in the same plant. Boilers in use numbered 182 with a total capacity of 44,509 h.p. according to the manufacturers' rating.

Table 31.—Value of Mineral Production of Nova Scotia,* 1899-1927

Year	Value	Year	Value
	\$		\$
1899.....	6,817,274	1914.....	17,584,639
1900.....	9,298,479	1915.....	18,088,342
1901.....	7,770,159	1916.....	20,042,262
1902.....	10,686,549	1917.....	21,104,542
1903.....	11,431,914	1918.....	22,317,108
1904.....	11,212,746	1919.....	23,445,215
1905.....	11,507,047	1920.....	24,130,017
1906.....	12,894,303	1921.....	28,912,111
1907.....	14,532,040	1922.....	25,923,499
1908.....	14,487,108	1923.....	29,648,893
1909.....	12,504,810	1924.....	23,820,352
1910.....	14,195,730	1925.....	17,625,612
1911.....	15,409,397	1926.....	28,873,792
1912.....	18,922,236	1927.....	30,111,221
1913.....	19,376,183		

*Includes a small production from Prince Edward Island.

Table 32.—Mineral Production of Nova Scotia, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Arsenic..... lb.	—	—	—	—	35,000	700
Gold..... fine oz.	1,626	33,612	1,678	34,687	3,151	65,137
Silver..... fine oz.	86	59	112	70	125	70
NON-METALLICS—						
Barytes..... tons	95	2,259	100	2,307	56	1,268
Coal..... tons	3,842,978	15,826,680	6,747,477	26,845,226	7,071,876	27,191,671
Diatomite..... tons	—	—	—	—	263	6,650
Grindstones..... tons	439	16,723	311	15,136	11	220
Gypsum..... tons	551,230	1,070,408	678,107	1,187,918	829,438	1,512,015
Quartz..... tons	1,362	6,760	8,333	29,018	4,834	16,721
Salt..... tons	6,598	49,889	8,165	68,781	14,391	102,590
Silica brick..... M	—	—	1,658	64,461	1,238	50,978
Tripolite..... tons	—	—	—	—	—	—
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....	—	*425,710	—	362,667	—	416,417
Lime..... bush.	8,243	3,464	453,797	59,777	873,200	100,254
Sand and gravel..... tons	286,614	155,362	230,307	52,052	812,976	522,723
Stone..... tons	102,125	134,686	92,315	150,792	72,451	120,807
Total.....	—	17,625,612	—	28,873,792	—	30,111,221

*Includes clay products from P.E.I. valued at \$3,020.

† Includes railway ballast from P.E.I., valued at \$5,475.

Table 33.—Principal Statistics of the Mineral Industry of Nova Scotia, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, coal and other minerals shipped from mines and quarries
			\$		\$	\$	\$
1923.....	80	113	63,544,560	15,280	17,613,514	2,927,317	27,759,500
1924.....	72	103	59,608,296	14,172	14,247,382	2,772,595	21,996,864
1925.....	67	95	59,456,860	9,905	12,488,285	2,229,275	16,412,311
1926.....	72	95	60,312,087	13,993	16,109,519	2,941,725	26,702,119
1927.....	78	107	70,934,465	15,663	18,076,122	2,283,744	27,966,861

NOTE.—The difference between the net values shown above, and those given in the next preceding table, is in the figures for gold. While the figures given above represent receipts from sales, the gold figures in the next preceding tables represent receipts by the Royal Mint during the year, valued at the standard rate for gold of \$20·671834 per fine ounce.

Table 34.—Number of Plants and Capital Employed in the Mineral Industry of Nova Scotia by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz	7	701,124	4,300	2,170	707,594	13	5,748,262	210,109	161,579	6,119,950
Coal.....	43	45,313,364	2,850,987	6,148,651	54,313,002	40	46,918,464	3,444,755	6,758,456	57,121,675
Gypsum.....	9	2,255,254	219,539	48,448	2,523,241	14	3,747,108	362,006	237,210	4,346,324
Clay products...	10	869,802	125,602	64,014	1,059,418	10	847,120	139,294	86,983	1,073,397
Sand and gravel...	8	18,951	—	—	18,951	10	—	—	—	—
Stone.....	9	1,133,993	22,968	9,041	1,166,002	8	1,115,816	26,422	784	1,143,022
†All other mines.	9	467,831	15,022	41,026	523,879	12	865,992	35,122	228,983	1,130,097
Total.....	95	50,760,319	3,238,418	6,313,350	60,312,087	107	59,212,762	4,217,708	7,473,995	70,934,465

† Includes data for 2 quartz mines, 1 barytes mine, 1 salt mine, 2 grindstone quarries, 1 silica brick plant and 2 lime plants in 1926; and for 1 silver-lead-zinc mine, 1 tungsten mine, 2 quartz mines, 1 salt mine, 3 natural abrasives plants, 2 lime plants, 1 barytes mine and 1 silica brick plant in 1927.

Table 35.—Employees, Salaries and Wages in the Mineral Industry of Nova Scotia, 1926 and 1927

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1926					\$	\$	\$
Auriferous quartz.....	6		145	151	12,000	95,971	107,971
Coal.....	485	37	12,100	12,622	1,003,717	14,041,702	15,045,419
Gypsum.....	32	3	742	777	77,547	542,023	619,570
Clay products.....	9	1	193	203	28,100	113,935	142,035
Sand and gravel.....	1		11	12	150	2,255	2,405
Stone.....	6		86	92	8,570	64,585	73,155
All other mines.....	4	1	131	136	9,805	109,159	118,964
Total.....	543	42	13,405	13,993	1,139,889	14,969,630	16,109,519
1927							
Auriferous quartz.....	13	1	248	262	19,395	167,803	187,198
Coal.....	479	35	13,317	13,831	1,023,809	15,676,318	16,700,127
Gypsum.....	25	4	939	968	70,537	695,789	766,326
Clay products.....	8	1	197	206	28,100	141,200	169,300
Sand and gravel.....			135	135		15,050	15,050
Stone.....	5		78	83	5,504	57,773	63,277
All other mines.....	8	2	168	178	14,557	160,287	174,844
Total.....	538	43	15,082	15,663	1,161,902	16,914,220	18,076,122

* See note page 30.

Table 36.—Wage-Earners in the Mineral Industry of Nova Scotia, by Months, 1926 and 1927

Month	1926	1927
January.....	11,941	14,436
February.....	10,963	14,340
March.....	9,987	14,273
April.....	12,634	14,614
May.....	13,776	14,786
June.....	13,908	15,195
July.....	14,089	15,134
August.....	14,008	14,932
September.....	13,956	14,958
October.....	14,307	14,970
November.....	14,551	14,715
December.....	14,681	14,525

Table 37.—Fuel and Electricity Used in the Mineral Industry of Nova Scotia, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	509,458	1,874,840	540,198	2,001,974
(b) Imported.....	Ton				
Anthracite coal.....	Ton				
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton	3,232	14,593	3,438	16,392
Gasoline.....	Imp. gal.	95,843	28,822	142,961	37,259
Kerosene.....	Imp. gal.			2,049	565
Fuel oil and diesel oil.....	Imp. gal.	43,104	4,954	128,344	18,292
Wood.....	Cord	4,069	20,602	4,961	21,384
Gas (a) Manufactured.....	M cu.ft.	17,439	1,630	180,196	14,416
(b) Natural.....	M cu.ft.				
Other fuel.....			51		816
Electricity purchased*.....	K.W.H.	71,557,807	996,233	5,732,708	172,646
Total.....			2,941,725		2,283,744
Electric generated*—					
(a) For own use.....	K.W.H.			63,276,380	
(b) For sale.....	K.W.H.			1,130,849	16,926

* In 1926, the record shows only total electricity used.

Table 38.—Power Employed in the Mineral Industry of Nova Scotia, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	130	49,061	111	47,458
Gasoline, gas and oil engines.....	46	1,807	45	2,580
Hydraulic turbines and water wheels.....	2	215	4	600
<i>Total primary power.....</i>	<i>178</i>	<i>51,083</i>	<i>160</i>	<i>50,638</i>
Electric motors run by purchased power.....	150	3,459	200	5,914
Total power employed.....	328	54,542	360	56,552
Electric motors run by primary power in same plant.....	352	28,673	342	28,377
<i>Total electric motors.....</i>	<i>502</i>	<i>32,132</i>	<i>542</i>	<i>34,291</i>
Boilers.....	170	42,182	182	44,509

NEW BRUNSWICK

Although there are many minerals of economic importance in the province of New Brunswick, development of these resources has not been so rapid as in other provinces of the Dominion probably because of the general concealment of the rocks by forests, which adds to the difficulty of locating mineralized areas suitable for commercial development. Actual mining has not progressed therefore to the extent that geological indications would warrant and very little of the province has been prospected.

At present, activities are restricted mainly to the mining of bituminous coal, the quarrying of gypsum and stone, and the production of petroleum, natural gas, lime and clay products.

The first discoveries of bituminous coal were made in the vicinity of Grand lake, Queens county, and small quantities were obtained from that region in 1782.⁽¹⁾ At the present time coal is found at several places in the broad carboniferous belt, extending westward from the coast, in Albert and Kent counties through Kings, Queens, Sunbury and York. There is a well-known deposit near Minto, Grand lake district, at Beersville on the coal branch of the Richibucto rim and at Dunsinane, 30 miles southwest of Moncton, but it has been worked economically only in the vicinity of Minto. Here, the seam runs from 16 to 30 inches in thickness and is found at various depths down to 120 feet.

Gypsum ranks next to coal and is found in localized deposits. It is quarried at Hillsborough and part of the production is there made into plaster by the Albert Manufacturing Company, who have a large and well-equipped plant.

Natural gas and petroleum produced in New Brunswick come from the Stoney Creek district south of Moncton. Extensive deposits of bituminous or oil-shales occur in Albert and Westmorland counties near Moncton, but as yet these have not been worked commercially.

Other materials such as wolframite—the ore of tungsten—copper in the form of chalcopyrite, iron ore in the form of siliceous magnetite, antimony, manganese and tripolite have also been located but production of these minerals is very limited.

The total recorded coal production of New Brunswick until the end of 1927 amounted to 3,315,843 short tons valued at \$12,613,135; the year of greatest output was 1922 when 287,513 short tons were mined. Production in 1927 from the 14 mines amounted to 203,950 short tons valued at \$885,038.

¹ W. G. Raymond, Proceedings of the Historical Society of St. John, 1897.

While the mine operators reported only 775 tons exported in 1927 directly from the mines to points in the United States, the Customs' records which include all coal cleared from customs through New Brunswick ports showed a total of 55,354 tons exported. During the same period imports cleared through customs ports of the province included 166,027 tons of coal from the United States and 31,209 tons from Great Britain. Anthracite included in this tonnage amounted to 101,660 tons of which 70,468 tons came from the United States and 31,192 tons from Great Britain.

Next to coal, the output of gypsum was the most important and amounted to 85,293 tons valued at \$524,550 in 1927 as against 59,546 tons valued at \$468,411 in 1926. Natural gas valued at \$124,637 showed a slight decrease from the output in 1926 and lime worth \$148,321 was also lower than in the previous year. Increases over 1926 occurred in the production of grindstones, petroleum, stone, sand and gravel and clay products.

Capital invested in the New Brunswick mining industries in 1927 amounted to \$3,014,614 of which \$2,476,878 represented the cost of lands, buildings, machinery and tools; \$237,988 the cost of supplies and stocks on hand; and \$299,748, the cash, trading and operating accounts and bills receivable. In 1926 the total stood at \$3,533,577; the cost of lands, buildings, etc., was \$2,858,131; supplies and stocks on hand, \$219,027; and cash, trading and operating accounts, \$456,419. Of the 1927 total, 50 per cent was invested in coal mines, the greater part of the remainder represented the capital employed in gypsum quarrying, gas and oil well operations, and grindstone quarries.

Wage-earners in the mining industry numbered 1,116 who were paid \$930,288 and salaried employees consisting of 72 males and 8 females received \$162,603. Coal mining gave employment to 587 people, while the gypsum quarries, the grindstone quarries and the gas companies engaged 284 people; lime manufacturing gave work to 72; clay products, 59; and stone and sand and gravel, 179.

Fuel and electricity used by the different industries cost \$125,847. Wood consumed mainly in lime kilns amounted to \$50,212, and bituminous coal used principally by the coal mines and for the calcining of gypsum was worth \$68,199. Electric power purchased amounted to \$4,143 in addition to which the coal mines developed power for their own use.

Primary power equipment in use consisted of 40 steam engines and 30 internal combustion engines with a total rating of 2,957 h.p. There were 34 electric motors with a capacity of 728 h.p., 8 of which were running on purchased power and 26 by primary power generated in the same plant. There were 47 boilers with a capacity of 2,868 h.p. in use during the year.

Table 39.—Value of Mineral Production of New Brunswick, 1899-1927

Year		Value	Year		Value
		\$			\$
1899	420,227	1914	1,014,570		
1900	439,060	1915	903,467		
1901	437,985	1916	1,118,187		
1902	607,129	1917	1,435,024		
1903	580,495	1918	2,144,017		
1904	559,913	1919	1,770,945		
1905	559,035	1920	2,491,787		
1906	646,328	1921	1,901,505		
1907	664,467	1922	2,263,692		
1908	579,816	1923	2,462,457		
1909	657,035	1924	1,969,260		
1910	581,942	1925	1,743,858		
1911	612,830	1926	1,811,104		
1912	771,004	1927	2,148,535		
1913	1,102,613				

Table 40.—Mineral Production of New Brunswick, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Antimony..... tons	—	—	—	—	—	—
Manganese ore..... tons	—	—	—	—	—	—
NON-METALLICS—						
Coal..... tons	208,012	815,367	173,111	710,245	203,950	885,038
Grindstones..... tons	1,642	79,661	1,684	90,975	1,860	97,197
Gypsum..... tons	71,745	408,917	59,546	468,411	85,293	524,550
Natural gas..... M. cu. ft.	639,235	122,394	648,316	128,300	630,755	124,637
Petroleum..... brl.	5,376	18,756	10,544	29,940	18,244	41,748
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....	—	69,473	—	75,851	—	87,185
Lime..... bush.	202,106	92,216	477,226	196,477	343,111	148,321
Sand and gravel..... tons	70,156	12,331	70,931	11,360	388,066	118,768
Stone..... tons	25,391	124,743	19,108	99,545	29,908	121,091
Total.....	—	1,743,858	—	1,811,104	—	2,148,535

Table 41.—Principal Statistics of the Mineral Industry of New Brunswick, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of ore, concentrates, coal and other minerals shipped from mines and quarries
			\$		\$	\$	\$
1923.....	44	79	3,300,139	1,334	1,339,229	154,823	2,434,312
1924.....	39	85	3,362,851	1,190	1,104,918	120,950	1,959,030
1925.....	36	85	3,070,322	1,113	1,003,169	114,629	1,734,613
1926.....	42	91	3,533,577	1,127	952,696	143,264	1,794,836
1927.....	41	79	3,014,614	1,196	1,092,891	125,847	2,106,635

Table 42.—Number of Plants and Capital Employed in the Mineral Industry of New Brunswick, by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Coal mining.....	11	1,357,866	24,623	305,620	1,688,109	14	1,401,391	30,747	94,326	1,526,464
Clay products.....	3	75,700	23,127	21,813	120,645	3	70,700	24,092	34,210	129,002
Lime.....	6	212,339	25,264	39,322	276,925	5	153,630	37,211	54,424	245,265
Stone.....	11	128,488	37,172	17,919	183,579	11	120,792	32,879	17,350	171,021
†All other mines.	60	1,083,738	108,841	71,740	1,264,319	46	730,365	113,059	99,438	942,862
Total.....	91	2,858,131	219,027	456,419	3,533,577	79	2,476,878	237,988	299,748	3,014,614

† Includes data for 35 natural gas wells, 17 petroleum wells, 2 gypsum quarries, 2 grindstone quarries and 4 sand and gravel pits in 1926; and for 1 antimony mine 38 natural gas wells, 2 gypsum quarries, 2 natural abrasives plants and 3 sand and gravel pits in 1927.

Table 43.—Employees, Salaries and Wages in the Mineral Industry of New Brunswick, 1926 and 1927

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1926					\$	\$	\$
Coal mining.....	27	2	544	573	62,573	432,006	494,579
Clay products.....	7	1	57	65	9,811	29,237	39,048
Lime.....	13		79	92	19,706	47,576	67,282
Sand and gravel.....			1	1		936	936
Stone.....	5		77	82	6,176	53,549	59,725
All other mines.....	17	6	291	314	73,768	217,358	291,126
Total.....	69	9	1,049	1,127	172,034	780,662	952,696
1927							
Coal mining.....	27	2	558	587	50,968	570,043	621,011
Clay products.....	7	1	51	59	9,811	32,184	41,995
Lime.....	10		62	72	16,400	50,198	66,598
Sand and gravel.....			75	75		12,498	12,498
Stone.....	10		94	104	12,810	56,611	69,421
All other mines.....	18	5	276	299	72,614	208,754	281,368
Total.....	72	8	1,116	1,196	162,603	930,288	1,092,891

*See note page 30.

Table 44.—Wage-Earners in the Mineral Industry of New Brunswick, by Months, 1926 and 1927

Month	1926	1927
January.....	900	844
February.....	852	857
March.....	925	933
April.....	922	940
May.....	999	1,097
June.....	1,128	1,149
July.....	1,106	1,136
August.....	1,071	1,130
September.....	1,025	1,001
October.....	996	1,086
November.....	972	970
December.....	892	896

Table 45.—Fuel and Electricity Used in the Mineral Industry of New Brunswick, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	9,538	47,077	13,529	68,199
(b) Imported.....	Ton				
Anthracite coal.....	Ton				
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton				
Gasoline.....	Imp. gal.	1,415	481	602	193
Kerosene.....	Imp. gal.			100	24
Fuel oil and diesel oil.....	Imp. gal.			100	10
Wood.....	Cord	12,169	61,854	10,396	50,212
Gas (a) Manufactured.....	M cu. ft.	26,972	6,007	12,904	3,066
(b) Natural.....	M cu. ft.				
Other fuel.....					
Electricity purchased*.....	K.W.H.	1,106,831	27,845	174,310	4,143
Total.....			143,264		125,847
Electricity generated:—*					
(a) For own use.....	K.W.H.			1,319,500	
(b) For sale.....	K.W.H.				

*In 1926 the record shows only total electricity used.

Table 46.—Power Employed in the Mineral Industry of New Brunswick, 1926 and 1927.

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	42	2,819	40	2,678
Gasoline, gas and oil engines.....	29	280	30	279
<i>Total primary power.....</i>	<i>71</i>	<i>3,099</i>	<i>70</i>	<i>2,957</i>
Electric motors run by purchased power.....	4	130	8	250
Total power employed.....	75	3,229	78	3,207
Electric motors run by primary power in same plant.....	28	518	26	478
<i>Total electric motors.....</i>	<i>32</i>	<i>648</i>	<i>34</i>	<i>728</i>
Boilers.....	44	2,950	47	2,868

QUEBEC

Quebec is the largest of all the Canadian provinces. It has a land area and water area of 706,834 square miles, and comprises the territory lying between the Hudson bay and Hudson strait and Labrador on the north, the gulf of St. Lawrence on the east, the province of New Brunswick and the United States on the south, and the province of Ontario on the west. Only the southern part of the province has ever been examined for mineralized areas, and until recently interest has been focussed on the non-metallic minerals of the province, as the main source of mineral wealth. In 1922, copper ores carrying gold were discovered in what is commonly called northern Quebec, but this term really refers to a section lying south of the main line of the Canadian National Railway, and just east of the Ontario boundary; it is a continuation of the mineralized belt of the Kirkland lake area that has added to Ontario's prominence as a mining area during recent years. Development of this section promises to be very extensive and with the introduction of transportation and smelting facilities, a large mining industry will no doubt be built up.

So far, the non-metallics have provided the greater part of the mineral output. Asbestos is the most important mineral product of Quebec. Other non-metals, arranged in order of their relative importance are: mica, magnesite, feldspar, quartz, iron oxides, pyrites, soapstone, and graphite. In the older and better known sections of the province there are copper, lead and zinc properties, which are operated on a small scale. Molybdenite and chromite have also been mined at different times when the market warranted an output of these minerals.

In recent years the development of hydro-electric power in Quebec has proven a great stimulus to industrial activity, particularly in the Shawinigan Falls area. A new power site at Chute à Caron on the Saguenay river has been developed and was put in operation in 1926; the chief industry in this section is the manufacture of aluminium metal from imported bauxite ores.

The value of the mineral production of Quebec in 1927 was \$28,870,403, an increase of 11 per cent over the total output of 1926 and 19 per cent over that recorded in 1925. Asbestos production valued at \$10,621,013, represented 36·8 per cent of the aggregate value of the mineral production of Quebec for the year and an increase of 10 per cent over the total for asbestos for the previous year. Cement at \$5,383,058 was 19 per cent greater than that recorded for 1926. The value of the various kinds of stone produced amounted to \$4,268,315 which showed an increase from that of 1926, clay products at \$2,734,738 showed a gain, and sand and gravel at \$1,880,931 was greater by 26 per cent than in the year immediately preceding. Zinc and lead produced at the Tetreault mine have shown marked increases in recent years whilst copper has also shown an advance, owing to the production from the Noranda smelter which began to produce copper on December 16, 1927. Silver production, as a result of the increases in the production of lead,

zinc and copper ores with which it is associated, also shows an upward trend. Other minerals showing improvement in 1927 over 1926 were iron ore, magnesite, iron oxides, mineral water, quartz, talc, lime and clay products, but decreases were noted in the outputs of feldspar, graphite, mica, phosphate and pyrites.

Capital employed in the mining industry in Quebec amounted to \$110,769,954, including \$90,322,233 invested in lands, buildings, machinery and tools; \$9,542,301 in supplies and stocks on hand; and \$10,905,420 in cash, trading and operating accounts and bills receivable.

Employees numbering 18,012 found work in Quebec metal mines, non-ferrous smelters, non-metal mines and in the production of clay products and other structural materials. Of these 820 males and 70 females were on a salary basis and 17,122 were wage-earners. Salaried employees received \$1,584,212 and wage earners, \$13,520,260.

The sand and gravel industry gave employment to 4,852 people, many of whom were engaged in getting out gravel for highway construction. Asbestos mining required 2,976 men, stone quarrying 3,089; and the mines of the Rouyn district reported an average of 1,481 for the year.

Employment showed rapid increase in June and July when over 16,000 people were at work in the mining industry as against 11,000 in May. The remaining months of the year, with the exception of December showed an average employment of over 12,000.

Fuel and electricity cost \$4,988,922 of which \$2,260,153 was expended for bituminous coal and \$2,358,213 for electric power. The cement industry consumed 53 per cent of the coal used and 17 per cent of the electric power, but the greater part of the total electric power was used by electric furnaces in the manufacture of aluminium at Arvida and Shawinigan Falls.

The total primary power equipment consisted of 115 units, 60 being steam engines and turbines, 40 internal combustion engines and 15 hydraulic turbines or waterwheels with a total rating of 56,184 h.p. There were 1,964 electric motors rated according to manufacturers at 96,146 h.p.; of these 1,873 were operated by purchased power and 91 by power generated in the same plant. Boilers numbered 122 with a capacity of 6,918 h.p.

Table 47.—Value of Mineral Production of Quebec, 1899-1927

Year	Value	Year	Value
	\$		\$
1899.....	2,585,635	1914.....	11,836,929
1900.....	3,292,389	1915.....	11,619,275
1901.....	3,759,984	1916.....	14,406,598
1902.....	3,745,636	1917.....	17,400,077
1903.....	3,585,938	1918.....	19,605,347
1904.....	3,688,482	1919.....	21,267,947
1905.....	4,405,975	1920.....	28,886,214
1906.....	5,242,058	1921.....	15,157,094
1907.....	6,205,553	1922.....	17,647,939
1908.....	6,372,949	1923.....	20,308,769
1909.....	7,086,265	1924.....	19,136,504
1910.....	8,270,136	1925.....	24,284,527
1911.....	9,304,717	1926.....	25,956,193
1912.....	11,656,998	1927.....	28,870,403
1913.....	13,475,534		

Table 48.—Mineral Production of *Quebec, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Copper..... lb.	2,510,141	352,474	2,674,058	368,886	3,119,848	403,084
Gold..... fine oz.	1,602	33,116	3,680	76,072	8,331	172,217
Iron ore, sold for export..... tons	3,978	11,934	200	600	2,019	8,980
Lead..... lb.	2,051,100	187,060	3,729,636	251,788	6,496,577	341,461
Molybdenite..... lb. (MoS ₂)	22,350	11,176	20,943	10,472	—	—
Silver..... fine oz.	214,943	148,451	375,986	233,513	730,864	417,625
Zinc..... lb.	9,936,000	757,322	12,904,176	956,199	17,189,045	1,064,690
NON-METALLICS—						
Asbestos..... tons	290,387	8,987,459	279,389	10,095,488	274,778	10,621,013
Feldspar..... tons	11,287	94,730	13,168	111,136	12,730	104,618
Garnets..... tons	—	—	—	—	2	150
Graphite..... tons	359	30,900	326	29,516	34	2,043
Magnesite..... tons	5,576	122,325	4,571	137,431	7,337	230,309
Mica..... tons	2,415	178,800	1,664	170,118	1,454	99,194
Mineral water..... Imp. gal.	7,122	2,961	6,956	2,444	10,330	1,813
Iron oxides..... tons	6,985	89,173	6,518	100,923	5,931	102,186
Phosphate..... tons	16	189	40	800	31	399
Pyrites..... tons	12,250	36,750	14,100	42,117	13,021	42,795
Quartz..... tons	6,459	30,064	24,550	107,779	49,141	132,615
Talc and soapstone..... tons	704	30,130	885	38,209	1,276	51,504
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	3,365,802	5,689,991	3,727,377	4,535,386	4,636,751	5,383,058
Clay products.....	—	2,426,887	—	2,702,298	—	2,734,738
Lime—						
Quicklime..... bush.	2,272,751	601,081	2,509,006	667,480	2,773,648	725,876
Hydrated lime..... tons	9,432	72,249	11,922	98,636	10,576	80,789
Sand and gravel..... tons	2,203,196	533,850	5,233,696	1,490,674	8,615,738	1,880,931
Stone..... tons	2,242,916	3,855,455	2,305,734	3,728,228	2,534,531	4,268,315
Total.....	—	24,284,527	—	25,956,193	—	28,870,403

* There is also in this province an important production of aluminium from imported ores.

Table 49.—Net Income from Sales of Products from the Mineral Industry of Quebec, 1926 and 1927

Industry	1926	1927
	\$	\$
Metal mining and metallurgical industries.....	*7,570,787	13,155,451
Non-metal mining industries.....	10,835,951	11,388,639
Clay products and structural material industries.....	13,222,702	15,073,707
Total.....	31,629,450	39,617,797

* Mine shipment values reported as received f.o.b. shipping point (i.e. gross value less freight and treatment charges) plus smelter sales less the cost of ores treated.

Table 50.—Principal Statistics of the Mineral Industry of Quebec, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates and other minerals shipped from mines, smelters and quarries
			\$		\$	\$	\$
1923.....	152	156	79,271,782	7,124	7,446,475	3,031,056	20,270,322
1924.....	240	242	77,163,613	6,953	7,300,935	2,800,763	18,921,782
1925.....	294	301	83,449,054	8,700	8,566,616	3,152,395	23,817,182
1926.....	331	1,399	112,460,615	15,555	11,912,344	4,662,165	31,629,450
1927.....	381	2,428	110,769,954	18,012	15,104,472	4,938,922	39,617,797

Table 51.—Number of Plants and Capital Employed in the Mineral Industry of Quebec, by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Copper-gold.....	63	16,046,935	305,781	2,067,352	18,420,068	91	9,458,800	263,844	2,950,782	12,673,426
Silver-lead-zinc....	5	2,815,000	49,100	465,000	3,329,100	5	2,910,000	62,509	817,505	3,790,014
Asbestos.....	15	30,131,261	2,112,348	2,442,537	34,686,146	13	30,837,295	1,686,084	2,793,442	35,316,821
Feldspar.....	10	135,770	11,927	22,856	170,553	17	143,281	17,330	46,565	207,176
Graphite.....										
Iron oxides.....	3	133,719	33,495	10,864	178,078	3	133,719	18,948	650	153,317
Mica.....	11	122,771	18,362	19,293	160,426	12	103,698	56,952	47,624	208,274
Quartz.....	6	172,516	9,268	5,426	187,210	7	228,795	7,180	35,497	271,472
Clay products.....	20	8,503,640	721,733	609,383	9,834,756	20	9,282,883	802,820	686,019	10,771,722
Cement.....	4	13,333,588	1,122,861	986,093	15,442,542	3	12,475,813	1,203,552	991,264	14,670,629
Lime.....	15	1,194,764	168,214	252,927	1,615,905	15	1,176,779	179,793	359,822	1,716,394
Sand and gravel.....	1,127	771,513	9,867	35,208	816,588	2,098	1,105,340	32,530	123,436	1,261,306
Stone.....	105	3,772,637	407,020	733,333	4,912,990	125	3,295,983	593,599	811,303	4,700,885
†All other industries.....	15	19,464,790	2,230,243	1,011,220	22,706,253	19	19,169,847	4,617,160	1,241,511	25,028,518
Total.....	1,399	96,598,904	7,200,219	8,661,492	112,460,615	2,428	90,322,233	9,542,301	10,905,420	110,769,954

† Includes data for 1 iron ore mine, 1 molybdenite mine, 2 metallurgical works, 2 graphite mines, 2 talc and soapstone quarries, 3 magnesite mines, 2 mineral water plants, 1 pyrites mine and 1 phosphate mine in 1926, and for 2 iron ore mines, 1 molybdenite mine, 3 metallurgical plants, 3 talc and soapstone quarries, 1 graphite mine, 3 magnesite mines, 3 mineral water plants, 1 phosphate mine, 1 pyrites mine and 1 garnet property in 1927.

Table 52.—Employees, Salaries and Wages in the Mineral Industry of Quebec, 1926 and 1927

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1926						\$	\$	\$
Copper-gold.....	133	7	1,083		1,223	241,167	1,108,651	1,350,118
Silver-lead-zinc....	13		232		245	26,466	274,412	300,878
Asbestos.....	129	12	2,656		2,797	328,813	3,215,284	3,544,097
Feldspar.....	3		122		125	4,690	63,100	67,790
Iron oxides.....	45		45		45	3,100	35,248	38,348
Mica.....	8	1	153		162	12,250	85,035	97,285
Quartz.....	5		54		60	13,755	35,624	49,380
Clay products.....	62	6	879	1	946	132,301	842,452	974,753
Cement.....	46	6	1,042		1,094	117,087	1,227,235	1,345,222
Lime.....	15	1	260		276	32,920	231,358	264,278
Sand and gravel.....	4		4,900		4,994	5,936	680,885	686,821
Stone.....	119	5	2,214		2,338	212,061	1,770,026	1,991,087
*All other industries.....	189	13	1,046		1,248	154,519	1,047,768	1,202,287
Total.....	728	52	14,774	1	15,555	1,285,965	10,626,378	11,912,344
1927								
Copper-gold.....	190	10	1,437		1,637	231,734	1,268,043	1,499,777
Silver-lead-zinc....	18		296		314	33,430	290,389	323,819
Asbestos.....	129	12	2,835		2,976	349,434	3,411,758	3,761,192
Feldspar.....	4		120		124	8,430	66,841	75,271
Iron oxides.....	3		45		48	3,750	34,930	38,680
Mica.....	3	1	107		111	4,920	68,122	73,042
Quartz.....	6		78		85	7,800	77,228	85,028
Clay products.....	71	7	1,001		1,079	149,938	918,480	1,068,418
Cement.....	46	6	859		911	107,791	1,138,863	1,246,654
Lime.....	18		262		280	32,415	227,582	259,997
Sand and gravel.....	30		4,817		4,852	55,773	695,040	750,813
Stone.....	115	5	2,969		3,089	200,509	2,564,970	2,765,479
*All other industries.....	187	23	2,292	4	2,506	398,288	2,758,014	3,156,302
Total.....	820	70	17,118	4	18,012	1,584,212	13,520,260	15,104,472

*See footnote to Table 51.

†See note page 30.

Table 53.—Wage-Earners in the Mineral Industry of Quebec, by Months, 1926 and 1927

Month	1926	1927
January.....	6,219	9,018
February.....	7,032	9,083
March.....	7,404	9,530
April.....	7,981	9,919
May.....	9,227	11,523
June.....	14,317	16,679
July.....	14,937	16,945
August.....	10,525	13,451
September.....	10,405	13,601
October.....	10,713	12,424
November.....	10,011	11,301
December.....	8,431	10,659

Table 54.—Fuel and Electricity Used in the Mineral Industry of Quebec, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	361,329	2,183,702	218,859	1,260,009
(b) Imported.....	Ton			145,808	1,000,144
Anthracite coal.....	Ton	16,608	113,655	15,481	107,129
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton	5,470	63,972	4,237	47,311
Gasoline.....	Imp. gal.	100,081	32,091	135,217	41,390
Kerosene.....	Imp. gal.			13,582	3,758
Fuel oil and diesel oil.....	Imp. gal.	200,242	25,141	145,932	14,174
Wood.....	Cord	33,354	161,579	30,418	156,790
Gas (a) Manufactured.....	M cu. ft.		31		4
(b) Natural.....	M cu. ft.				
Other fuel.....					
Electricity purchased*	K.W.H.	600,944,099	2,081,994	808,158,560	2,358,213
Total.....			4,662,165		4,988,922
Electricity generated*					
(a) For own use.....	K.W.H.			239,608,396	
(b) For sale.....	K.W.H.				

*In 1926 the record shows only total electricity used.

Table 55.—Power Employed in the Mineral Industry of Quebec, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	138	5,340	60	3,475
Gasoline gas and oil engines.....	51	815	40	983
Hydraulic turbines and water wheels.....	14	51,725	15	51,726
<i>Total primary power.....</i>	<i>203</i>	<i>57,880</i>	<i>115</i>	<i>56,184</i>
Electric motors run by purchased power.....	1,370	74,100	1,873	93,716
Total power employed.....	1,573	131,980	1,988	149,900
Electric motors run by primary power in same plant.....	178	6,154	91	2,430
<i>Total electric motors.....</i>	<i>1,543</i>	<i>80,254</i>	<i>1,964</i>	<i>96,146</i>
Boilers.....	118	6,810	122	6,918

ONTARIO

The province of Ontario may be described as the central province of the Dominion; Hudson bay and James bay are on the north, the St. Lawrence river and the Great Lakes constitute the greater part of the southern boundary, the province of Quebec lies immediately to the east, and Manitoba adjoins Ontario on the west. Traversing the province in easterly and westerly directions, the main lines of the Canadian National and Canadian Pacific Railways, with their many branch lines provide an extensive system of transportation. The main line of the Canadian Pacific Railway from Montreal to Winnipeg crosses the rich Sudbury section in a westerly direction, then runs along the north shore of lake Superior and through the lake of the Woods district. In the vicinity of Sudbury are the famous nickel-copper properties which supply the greater part of the world's nickel. The Temiskaming and Northern Ontario Railway connects North Bay and Cochrane and runs through the rich silver camps of the Cobalt and South Lorrain areas and has branch lines extending to other silver camps and to the gold camps of Kirkland lake and Porcupine.

Mining was carried on in Ontario as far back as 1770, when copper was recovered from mines on the shores of lake Superior. Thus, although very little mining of any consequence was done until recent years, this province early took its place in the mining history of Canada. About the year 1800, the first iron furnace in the province was erected in Leeds county, and a few years later a blast furnace for the smelting of bog ores was built at Normandale in Norfolk county. This initial effort proved a failure but later another attempt was made and smelting was carried on, as a successful enterprise until 1847. Other iron furnaces were established in different parts of this older section of Ontario, but their operations were never very successful. In 1899 the Algoma Steel Corporation of Sault Ste. Marie opened the Helen mine on the northeast shore of lake Superior, and other iron properties, namely the Magpie mine and the Moose Mountain mine, have also been operated by this company. At the present time there is practically no production of iron ore in Ontario, the steel companies finding it more economical to bring in ore from the United States.

Construction of the Canadian Pacific Railway in 1883 led to the discovery of the rich nickel-copper ores in the Sudbury district. Fortunately, about this time also it was found that the addition of nickel in the manufacture of steel armour plate made the plate much stronger and harder and therefore more useful. For some years after the opening up of the Sudbury area, one of the larger properties was operated as a copper mine, the nickel in the ore not being detected until about 1887. About 90 per cent of the world's output of nickel comes from the Sudbury area. The deposits there are very great. These ores also carry precious metals such as gold, silver, platinum, palladium, rhodium, and other related metals.

Ontario has the distinction of having had the first producing oil well on the American continent. This well was dug at Oil Springs in Lambton county in the year 1858, and from that time forward, oil wells have been discovered in other sections of that part of Ontario. However no large oil fields have been found since 1905, and consequently the annual production has been steadily declining despite the additional production of a few small new fields.

As far back as 1866 gold was discovered in a spectacular occurrence at the Richardson property, Hastings county, and that district was the scene of a small gold rush at that time. Other properties in the same vicinity were worked intermittently, but at the present time no gold is being recovered from that area. Other finds were made from time to time in various parts of the province, and in 1899 Ontario reported a production of the yellow metal valued at \$421,591.

Five years after this, the Temiskaming and Northern Ontario Railway was projected and built from North Bay in a northerly direction. This opened up a country of which, hitherto, little had been known, and fortunately, passed right through the now famous Cobalt area, which was thus discovered in 1903. The finding of such a rich silver deposit led to intense prospecting on either side of the railway; the silver camps of Gowganda, Elk Lake and South Lorrain and the rich gold areas of Porcupine and Kirkland lake are the present outcome of these early endeavours.

Although the production of silver has fallen off to some extent in late years, intensive prospecting underground had resulted in the finding of blind veins in some of the older properties; these have helped to maintain the silver output. Gold production on the other hand has grown

apace. Some companies with proven ore bodies have augmented their milling facilities, and increased their outputs. Through intensive underground exploration many others are changing prospects into mines.

Mention may here be made of the Silver Islet mine on an extremely small island off Thunder cape in lake Superior which was worked for fifteen years or more and which produced in the neighbourhood of \$3,500,000 worth of silver. This property was extremely rich, but was at one time flooded with water, and any attempt to work it since has met with very little success; diamond drilling has disclosed nothing of value at depth.

Lead is known to occur in different sections of Ontario, but until recent years, little production was reported. In 1915, however, the Kingdon Mining, Smelting and Manufacturing Company Limited, opened up a property near Galetta in Carleton county, and production of lead has increased steadily since that time.

Ontario mineral deposits include a large number of non-metallic minerals of economic value. The largest mica mine in Canada is located near Sydenham in Frontenac county, and this county also supplies the greater part of the feldspar produced in the province. Talc is mined in the vicinity of Madoc in Hastings county. The salt-producing sections of the province are in the southwestern part. No rock salt is mined, the entire output coming from brine pumped from wells; the development of the salt industry dates back to 1865 when the first well was sunk at Goderich in Huron county in a search for oil.

Natural gas was discovered in Ontario in December, 1888, in Essex county near the present town of Leamington, and in the following year a well was opened up in Welland county about 25 miles west of Niagara Falls. At that time there was little market in Canada for natural gas, so the gas from these wells was piped to the neighbouring cities of Detroit, Toledo and Buffalo. Some of the older wells are now becoming depleted, but new wells are brought in from time to time. The natural gas supply, however, is now being conserved under government supervision so that the most economic use may be made of the available supply.

Clay products and construction materials industry has grown with the increasing demand for such commodities. Portland cement is manufactured in various sections of the province where suitable limestone and clay have been found at convenient distances from the large markets for this class of material. Hydrated lime and quicklime are also being manufactured and the growth of the brick industry has been rapid. The construction of highways and the building of concrete structures has enlarged the demand for gravel and crushed stone. These apparently common materials form a very large part of the non-metallic mineral production of the province.

In 1927 the value of the mineral production of Ontario was \$89,982,962, which was made up of metallic minerals valued at \$62,852,482; non-metallic minerals, including natural gas and oil valued at \$7,468,442; clay products valued at \$5,853,035; and other structural materials such as cement, lime, sand and gravel, and stone valued at \$13,809,003.

Gold produced in Ontario during the year was valued at \$33,634,108, or equal to 37.4 per cent of the total mineral production of the province and more than twice the value of nickel which was second on the list. During the years 1887 to 1927 the total value of Ontario's output of gold amounted to \$248,277,474, of which ninety-nine per cent has been produced since 1912, the first year that the Porcupine camp began to produce in quantity. Nickel output values in 1927 amounted to \$15,262,171 or nearly 17 per cent of the provincial total for all minerals. The total nickel produced in Ontario to the end of 1927 reached \$405,264,283 in value or 63 per cent more than the total gold production since 1887. Silver production in 1927 amounted to 9,307,953 fine ounces valued at \$5,246,893, the lowest value since 1906 when the Cobalt camp was in its infancy. Since 1887, Ontario has produced silver to the value of \$244,631,460, which is 3.6 million dollars less than the value of gold produced during the same period. Copper produced in 1927 was greater than in any other year since 1918 and amounted to 45,341,295 pounds valued at \$4,946,533. Cobalt production in 1927 showed a considerable increase from the previous year, the output amounting to 880,590 pounds valued at \$1,764,534 as against 664,778 pounds valued at \$1,136,014 in 1926. Prior to 1926 Ontario produced annually 95 per cent of the world's supply of cobalt. Lead production of the province is supplied by the Galetta lead mine in Carleton county; platinum and palladium and other

precious metals are recovered in refining the nickel-copper ores from the Sudbury district, while small amounts of antimony and bismuth are recovered from time to time from the Cobalt ores.

Among the fuels and other non-metallics the output of natural gas has the greatest value: in 1927 it amounted to \$4,331,780 which was slightly less than in the preceding year.

Salt production valued at \$1,510,777 was higher than in 1926 and gypsum worth \$500,688 was also greater than in the preceding year. Substantial quantities of quartz, feldspar, graphite, mica and talc were mined and sold and a production was also reported of actinolite, mineral waters, crude petroleum, phosphate, pyrites and silica brick.

Clay products were the principal items in the structural materials group, their value amounting to \$5,853,035 as against \$5,356,469 in 1926. Cement output was greater than in the previous year, the output of 3,751,786 barrels was valued at \$5,144,326 as against 3,398,860 barrels worth \$4,792,857 in 1926. Quicklime and hydrated lime showed slight gains and were valued at \$2,198,239 as against \$2,051,446 in 1926; stone of all kinds and sand and gravel; both showed substantial gains over the totals for the previous year and reflected the progress being made in road-building and other construction work throughout the province.

Capital invested in Ontario's mining industry in 1927 amounted to \$282,205,248 as against \$278,657,190 in 1926. Of this, 33.4 per cent was invested in gold mining; 10.7 per cent in silver-cobalt mining; 11.9 per cent in non-ferrous metallurgical works; 11.6 per cent in natural gas; 5 per cent in clay products; 3.9 per cent in stone and sand and gravel; and the remainder among other mining industries, two of the most important being nickel-copper mining and the manufacture of Portland cement.

Employees numbered 21,147 in 1927 of whom 1,702 on salary received \$3,724,221 for their services and 19,445 wage-earners were paid \$25,028,940. Gold mining gave work to 7,051 people and the smelting and refining work of the nickel companies and the metallurgical works smelting the ores from the Cobalt district employed in all, 2,271. Clay products plants accounted for 2,504; stone quarries, 1,478; while cement plants, nickel-copper mines and smaller properties accounted for all the other employees.

Monthly employment records showed January to be the month of least employment in 1927 while June, July, August, September and October were the months during which the industry employed the largest number. Most mining companies show a slight increase in numbers on their payroll during the summer months. General construction and road-making for which stone and sand and gravel must be supplied also provide for greater employment in the summer months.

The expenditure for fuel and electricity for 1927 was slightly under that of the previous year. Less anthracite coal, coke, fuel oil and gasoline were consumed. The value of electric power purchased in 1927 was \$2,967,104. Gold mining took 58 per cent of the total electric power used in the mining industry; metallurgical plants used 9 per cent; silver-cobalt mining, 10 per cent; and cement plants, 7 per cent. Cement plants used 28.6 per cent of the total coal burned, and plants for the manufacture of brick and other clay products, used 23 per cent. Metallurgical industries accounted for 94 per cent of the total coke consumed and 76 per cent of the fuel oil used by the entire group.

Primary power equipment in use consisted of 256 steam engines, 257 internal combustion engines and 10 hydraulic turbines with a total rating of 27,996 h.p. There were 3,427 electric motors with a total h.p. of 165,925; of these 3,317 were operated by purchased power and 110 by power generated in the same plant. Boilers totalled 268 with a total capacity of 26,553 h.p. according to the manufacturers' rating.

Table 56.—Value of Mineral Production of Ontario, 1899-1927

Year	Value	Year	Value
	\$		\$
1899.....	9,819,557	1914.....	53,034,677
1900.....	11,258,099	1915.....	61,071,287
1901.....	13,970,010	1916.....	80,461,323
1902.....	14,619,091	1917.....	89,066,600
1903.....	14,160,033	1918.....	94,694,093
1904.....	12,532,843	1919.....	67,917,998
1905.....	18,833,292	1920.....	81,715,808
1906.....	25,111,682	1921.....	57,356,651
1907.....	30,381,638	1922.....	65,866,029
1908.....	30,623,812	1923.....	80,825,851
1909.....	37,374,577	1924.....	86,398,656
1910.....	43,538,078	1925.....	87,980,436
1911.....	42,796,162	1926.....	84,702,296
1912.....	51,985,876	1927.....	89,982,962
1913.....	59,167,749		

Table 57.—Mineral Production of *Ontario, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Antimony..... lb.	1,751	206	1,596	281		
Arsenic (As ₂ O ₃)..... lb.	2,156,441	113,324	4,055,477	135,549	4,961,178	197,668
Bismuth..... lb.	19,667	18,566	6,440	6,440	2,072	1,003
Cobalt..... lb.	1,116,492	2,328,517	664,778	1,136,014	880,590	1,764,534
Copper..... lb.	39,718,777	5,577,311	41,312,867	4,828,964	45,341,295	4,946,533
Gold..... fine oz.	1,461,039	30,202,357	1,497,215	30,950,180	1,627,050	33,634,108
Iron pig from Canadian ore..... tons						
Lead..... lb.	7,209,534	657,510	7,398,795	580,730	7,990,709	528,729
Nickel..... lb.	73,857,114	15,946,872	65,714,294	14,374,163	66,798,717	15,262,171
Palladium..... fine oz.	8,288	848,969		640,178	11,545	554,190
Platinum..... fine oz.	8,692	1,027,477	9,471	919,349	11,217	716,653
Silver..... fine oz.	10,529,131	7,271,944	9,274,965	5,760,402	9,307,953	5,246,893
Zinc..... lb.	179,545	13,685				
NON-METALLICS—						
Actinolite..... tons	40	500	80	1,000	86	1,075
Asbestos..... tons	2	901	14	3,935		
Feldspar..... tons	17,394	141,059	22,783	199,102	17,119	154,533
Fluorspar..... tons	12	200				
Garnets..... tons						
Graphite..... tons	2,210	127,863	2,401	165,344	1,795	109,613
Grinding pebbles..... tons	105	945		576		
Gypsum..... tons	82,020	491,833	89,987	496,059	83,998	500,688
Mica..... tons	1,605	82,663	881	59,086	1,284	75,183
Mineral water..... Imp.gal.	183,012	25,452	208,400	27,277	293,200	12,811
Natural gas..... M cu. ft.	7,143,962	3,958,006	7,764,996	4,409,593	7,311,215	4,331,780
Peat..... tons	1,370	8,394				
Petroleum..... bbl.	143,134	386,555	137,850	379,221	139,606	288,347
Phosphate..... tons					82	824
Pyrites..... tons	685	8,799	371	4,912	463	6,077
Quartz..... tons	188,560	324,526	192,733	339,304	159,150	266,204
Salt..... tons	226,315	1,352,504	252,345	1,388,672	254,181	1,510,777
Silica brick..... M			1,307	66,241	553	28,549
Talc and soapstone..... tons	13,678	174,116	14,882	178,986	15,138	181,981
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... bbl.	3,462,358	5,253,911	3,398,800	4,792,857	3,751,786	5,144,326
Clay products.....		5,195,084		5,356,469		5,853,035
Lime—						
Quicklime..... bush.	5,115,974	1,566,540	5,402,261	1,593,468	5,668,087	1,657,552
Hydrated..... tons	41,610	477,535	39,217	457,978	44,749	540,687
Sand and gravel..... tons	5,201,604	1,779,129	6,483,163	2,292,678	7,512,783	2,405,729
Stone..... tons	3,022,712	2,817,333	3,622,042	3,157,288	4,254,960	4,060,709
Total.....		87,980,436		84,702,296		89,982,962

* The total production of blast-furnace pig-iron in Ontario, in 1925, was 368,971 long tons valued at \$7,873,816; in 1926 it was 507,079 long tons valued at \$11,166,738; and in 1927 it was 406,148 long tons valued at \$9,202,960.

Table 58.—Net Income from the Sales of Products from the Mineral Industry of Ontario, 1926 and 1927 (Quantities shown are final shipments during the year; except as noted, values given are those reported as received, f.o.b. shipping point.

Industry and Product	1926		1927	
	Quantity	Value \$	Quantity	Value \$
GOLD MINING INDUSTRY—				
Crude bullion..... fine oz.	1,902,442	30,970,538	2,167,293	33,621,783
Concentrates, slags, etc..... tons	878	73,115	824	94,852
Total for gold mining industry.....		31,043,653		33,716,635
NICKEL-COPPER INDUSTRY—				
Nickel-Copper Mining—				
Ores (estimated value)..... tons	1,322,050	4,627,175	1,305,917	5,223,668
Nickel-Copper Metallurgical Works—				
Smelter and refinery sales less the estimated cost of ores treated... (Products: Matte exported, and sales of refined nickel, converter copper, nickel oxide, gold, silver and metals of the platinum group).		16,280,470		16,193,222
Total for nickel-copper industry.....		20,907,645		21,416,890
SILVER-COBALT INDUSTRY—				
Silver Cobalt Mining				
Silver bullion..... fine oz.	3,094,394	1,924,693	2,040,070	1,151,544
Ores, concentrates and residues—				
(a) Shipped to Canadian smelters..... tons	4,755	2,961,860	3,793	3,175,496
(b) Exported..... tons	2,997	583,880	2,714	433,506
Silver-Cobalt Metallurgical Works—				
Smelter and refinery sales less the estimated cost of ores, etc., treated..... (Products: Silver bullion, arsenic, nickel and cobalt (in the form of metal, oxides and salts), speiss residues, and silver-lead- bismuth bullion).		1,406,874		1,414,424
Total for silver-cobalt industry.....		6,877,307		6,174,970
LEAD INDUSTRY—				
Lead Mining—				
Ores (estimated value)..... tons	4,535	367,309	3,992	399,238
Lead Metallurgical Works—				
Pig lead (less the estimated cost of ores treated)..... pounds	7,346,179	209,791	7,984,776	129,179
Zinc concentrates exported..... tons				
Total for lead industry.....		577,100		528,417
Total—				
(a) Metal mining and metallurgical works listed above.....		59,405,705		61,836,912
(b) Non-Metal mining industries, including fuels.....		7,719,308		7,325,692
(c) Structural materials and clay products industries, as per Table 57.....		17,650,738		19,662,038
Grand total.....		84,775,751		88,824,642

*See Table 57.

Table 59.—Principal Statistics of the Mineral Industry of Ontario 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, con- centrates and other minerals shipped from mines, smelters and quarries
			\$		\$	\$	\$
1923.....	1,224	5,613	240,899,437	17,978	23,469,827	9,932,155	71,042,009
1924.....	1,120	5,255	261,071,390	19,265	24,624,854	8,679,474	75,216,531
1925.....	1,210	5,898	258,967,755	19,346	25,909,951	8,463,276	86,641,647
1926.....	1,142	5,753	278,657,190	20,060	26,987,635	8,668,666	84,710,014
1927.....	1,014	5,592	282,205,248	21,147	28,753,161	8,642,617	88,824,642

Table 60.—Number of Plants and Capital Employed in the Mineral Industry of Ontario by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz	38	61,811,372	2,961,923	24,190,268	88,963,563	46	65,613,387	1,876,241	26,848,329	94,337,957
Silver-cobalt.....	37	31,412,576	998,390	8,093,755	40,504,721	26	23,815,697	1,024,241	5,283,707	30,123,645
Silver-lead-zinc.....	3	1,498,002	92,814	43,900	1,634,716	4	3,012,320	295,303	393,837	3,701,460
Metallurgical works.....	5	19,347,617	7,333,153	5,923,843	32,604,613	5	19,488,993	7,982,254	6,124,889	33,596,136
Feldspar.....	20	375,676	25,623	10,498	411,797	12	102,607	12,471	724	115,802
Graphite.....										
Mica.....	11	20,192	2,360	3,500	26,052	8	22,842	4,160	17,296	44,298
Natural gas.....	2,134	24,120,999	489,206	5,890,669	30,500,874	2,181	26,930,822	646,361	5,344,667	32,921,850
Petroleum.....	2,758	1,975,464	25,562	25,775	2,026,801	2,669	2,046,056	23,753	20,981	2,090,790
Quartz.....	8	722,323	92,436	2,580	817,339	8	385,356	84,639	500	470,495
Salt.....	10	1,539,870	253,665	582,402	2,375,937	9	1,608,790	300,345	369,524	2,278,659
Talc and soapstone.....	4	597,097	34,601	37,836	669,534	4	611,120	26,126	32,351	669,597
Clay products.....	133	10,150,773	1,406,165	1,593,036	13,149,974	131	11,164,549	1,398,446	1,488,325	14,051,320
Lime.....	28	1,636,927	203,370	172,625	2,012,922	29	1,763,605	238,529	225,265	2,227,399
Sand and gravel.....	457	3,457,853	37,032	206,851	3,701,736	350	4,061,806	42,742	441,919	4,546,467
Stone.....	84	4,808,347	290,343	498,879	5,597,569	86	5,774,455	287,235	560,842	6,622,532
†All other mines.....	23	50,492,060	1,698,151	1,468,831	53,659,042	24	51,416,777	1,487,573	1,502,491	54,406,841
Total.....	5,753	213,967,148	15,944,794	48,745,248	278,657,190	5,592	217,819,182	15,730,419	48,655,647	282,205,248

† Includes, data for 6 nickel-copper mines, 1 asbestos mine, 1 graphite mine, 2 gypsum quarries, 1 grinding pebbles plant, 3 cement plants, 1 actinolite mine, 1 pyrites mine, 1 silica brick plant, and 6 mineral water plants in 1926; and for 6 nickel copper mines, 2 gypsum quarries, 4 cement plants, 1 actinolite mine, 1 graphite mine, 7 mineral water plants, 1 phosphate plant, 1 pyrites mine and 1 silica brick plant in 1927.

Table 61.—Employees, Salaries and Wages in the Mineral Industry of Ontario 1926 and 1927

Industry	†Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages
	Male	Female	Male	Female		\$	\$
1926						\$	\$
Auriferous quartz.....	382	21	6,274		6,677	1,197,573	9,543,317
Silver-cobalt.....	143	13	1,623		1,779	400,403	2,415,527
Silver-lead-zinc.....	22	1	211		234	43,156	300,972
Metallurgical works.....	160	15	2,031		2,206	502,048	2,790,521
Feldspar.....	9	1	275		285	13,760	132,021
Mica.....	2		43		46	5,418	25,560
Natural gas.....	330	76	454		860	455,271	387,034
Petroleum.....	14	1	118		133	17,594	96,476
Quartz.....	8		122		130	12,708	102,230
Salt.....	36	10	256	32	334	111,606	308,948
Talc and soapstone.....	6	1	48		55	11,940	47,084
Clay products.....	134	27	2,009	1	2,171	348,174	1,967,764
Lime.....	30	7	408		445	72,737	412,988
Sand and gravel.....	45	7	444		496	118,157	521,379
Stone.....	64	22	1,579		1,665	141,076	1,106,621
*All other mines.....	74	6	2,464		2,544	177,498	3,200,078
Total.....	1,459	209	18,359	33	20,060	3,629,109	23,358,526
1927							
Auriferous quartz.....	394	27	6,625	5	7,051	1,238,776	10,286,691
Silver-cobalt.....	105	4	1,349		1,458	285,498	1,892,665
Silver-lead-zinc.....	48	1	409		458	64,426	594,993
Metallurgical works.....	168	15	2,087	1	2,271	537,987	2,919,277
Feldspar.....	3		107		110	9,313	73,069
Mica.....	2	2	43		47	6,489	28,335
Natural gas.....	292	95	636		1,023	472,200	598,328
Petroleum.....	23		113		136	24,682	90,516
Quartz.....	7		103		110	9,657	90,232
Salt.....	37	12	289		338	111,980	322,549
Talc and soapstone.....	5	2	58		65	10,698	51,834
Clay products.....	161	28	2,315		2,504	398,917	2,129,687
Lime.....	34	10	410		454	82,005	422,097
Sand and gravel.....	51	6	849		906	118,975	671,923
Stone.....	65	17	1,396		1,478	160,571	1,143,385
†All other mines.....	83	5	2,650		2,738	198,147	3,713,359
Total.....	1,478	224	19,439	6	21,147	3,724,221	25,028,940

*See footnote to Table 60.

†See note page 30.

Table 62.—Wage-Earners in the Mineral Industry of Ontario, by Months, 1926 and 1927

Month	1926	1927
January.....	15,341	15,478
February.....	15,113	15,797
March.....	15,523	16,337
April.....	16,256	17,381
May.....	17,356	18,431
June.....	18,124	19,456
July.....	18,484	19,547
August.....	18,558	19,721
September.....	18,525	19,623
October.....	18,470	19,382
November.....	17,499	18,533
December.....	16,300	17,006

Table 63.—Fuel and Electricity Used in the Mineral Industry of Ontario, 1926 and 1927

Kind	Unit of Measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	588,161	3,656,281	603,392	3,534,639
(b) Imported.....	Ton				
Anthracite coal.....	Ton	6,270	60,139	4,355	42,451
Lignite coal (a) Canadian.....	Ton	158	688		
(b) Imported.....	Ton				
Coke.....	Ton	158,098	1,455,272	148,529	1,311,425
Gasoline.....	Imp. gal.	183,913	60,767	137,546	34,065
Kerosene.....	Imp. gal.			38,962	9,390
Fuel oil and diesel oil.....	Imp. gal.	3,633,189	378,694	3,396,389	325,149
Wood.....	Cord	72,644	346,820	68,429	354,884
Gas (a) Manufactured.....	M cu. ft.	35,476	19,675	6,902	329
(b) Natural.....	M cu. ft.				
Other fuel.....			36,875	48,656	26,022
Electricity purchased*.....	K.W.H.	377,113,449	2,653,455	467,352,053	2,967,104
Total.....			8,668,666		8,642,617
Electricity generated*.....					
(a) For own use.....	K.W.H.			1,068,728	
(b) For sale.....	K.W.H.				

*In 1926, the record shows only total electricity used.

Table 64.—Power Employed in the Mineral Industry of Ontario, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	284	18,959	256	16,377
Gasoline, gas and oil engines.....	263	6,627	257	8,132
Hydraulic turbines and water wheels.....	5	1,480	10	3,487
Total primary power.....	552	27,066	523	27,996
Electric motors run by purchased power.....	2,988	146,379	3,317	162,329
Total power employed.....	3,540	173,445	3,840	190,325
Electric motors run by primary power in same plant.....	84	1,948	110	3,596
Total electric motors.....	3,072	148,327	3,427	165,925
Boilers.....	288	28,492	268	26,553

MANITOBA

Until recently, Manitoba was looked upon as a grain-growing province only and such work as was done on the mineral resources of the province was confined mainly to the non-metallic minerals. The earliest mineral industry was the extraction of salt from the brine springs on the west side of lake Manitoba and lake Winnipegosis by freedmen from the Hudson's Bay Company service. As Winnipeg grew, demand became greater for building stone and the Tyndall limestone of the province is now used in the construction of many imposing Canadian buildings.

Gypsum deposits were opened up northwest of lake St. Martin in the late nineties and have been in continuous operation since that time. Brick-making was carried on in several towns as the demand grew and Portland cement manufacture was established at Fort Whyte.

Prospecting for metalliferous deposits and the establishment of metal mining are more recent developments. In the northwest section of the province, the Flin Flon and Sherritt-Gordon mines, large copper-zinc deposits, have been located. Experimental work is now being carried on, in the treatment of the ore from the Flin Flon. Gold has been found in several areas east of lake Winnipeg and important mining companies are engaged in developing prospects in this field.

Manitoba is now regarded as having great possibilities as a mineral-producing province; more than three-fifths of its total area is underlain by Precambrian formations similar to those found so richly mineralized in the neighbouring province of Ontario.

Manitoba's mineral production in 1927 was valued at \$2,888,912, which was about \$200,000 less than the previous year, when the value of the output amounted to \$3,073,528. Cement valued at \$1,378,121 was much greater in value than any other mineral product of the province and represented nearly 50 per cent of the total value of the mineral production for the year. Gypsum at \$512,008 was next on the list and the total value was greater than in any other year since 1921. In the structural materials group, sand and gravel were the only products which showed improvement over the previous year.

Capital employed in the mining industries in 1927 amounted to \$11,780,120 comprising \$9,780,086 invested in lands, buildings, machinery and tools; \$608,621 in value of supplies and stocks on hand; and \$1,391,413 in cash, trading and operating accounts and bills receivable. In 1926 the total capital invested was \$10,636,439 of which \$9,066,988 represented the total investment in lands, buildings, machinery and tools; \$595,589 in supplies and stocks on hand; and \$973,862 in cash, trading and operating accounts and bills receivable.

Employees in the mineral industry in 1927 numbered 1,007 of whom 82 received \$199,316 in salaries. The remainder, numbering 925, were wage-earners who were paid \$1,033,489 for their services. Copper-gold-silver mines gave work to 86 people, clay products companies employed 104, stone quarrying accounted for 155 people and the remainder were working in the lime plants, sand and gravel pits, gypsum mining and milling, and in cement manufacture.

During the month of January, 374 people on the average were employed in the mining industry. The number rose each month until a maximum of 1,042 was reached in July. During the remaining months of the year there was a gradual recession to 647 in December.

Fuel and electricity used cost \$590,225; bituminous coal at \$322,796 represented 55 per cent of the total. Cement plants accounted for the greater part of the total bituminous coal and electric power consumed while clay products industries and lime kilns used 66 per cent of the wood. Wood was also used by gold-mining companies in the outlying districts where electric power was not available.

Primary power equipment consisted of 24 units with a combined rating of 865 h.p. Of these 16 were steam engines at 725 h.p. and 8 were internal combustion engines rated at 140 h.p. Electric motors running on purchased power numbered 171 with a rating according to the manufacturer of 8,354 h.p. There were 19 boilers in use rated at 1,216 h.p.

Table 65.—Value of Mineral Production of Manitoba, 1907*-1927

Year	Value	Year	Value
	\$		\$
1907.....	898,775	1918.....	3,120,600
1908.....	584,374	1919.....	2,868,378
1909.....	1,193,377	1920.....	4,223,461
1910.....	1,500,359	1921.....	1,934,117
1911.....	1,791,772	1922.....	2,258,942
1912.....	2,463,074	1923.....	1,768,037
1913.....	2,214,496	1924.....	1,534,249
1914.....	2,413,489	1925.....	2,276,759
1915.....	1,318,387	1926.....	3,073,528
1916.....	1,823,576	1927.....	2,888,912
1917.....	2,628,264		

*Prior to 1907 the Manitoba production was grouped with Saskatchewan, Alberta and the Yukon.

Table 66.—Mineral Production of Manitoba, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Gold.....fine oz.	4,424	91,452	188	3,886	182	3,762
Silver.....fine oz.	477	329	18	11	12	7
NON-METALLICS—						
Gypsum.....tons	35,088	417,868	35,172	461,461	39,895	512,008
Natural gas.....M cu. ft.	200	60	200	60	200	60
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brl.	407,395	1,037,929	612,155	1,572,401	551,698	1,378,121
Clay products.....		173,794		248,497		201,454
Lime.....bush.	450,315	170,230	685,389	251,260	648,975	246,279
Sand and gravel.....tons	727,152	196,601	989,581	178,059	1,338,580	228,655
Stone.....tons	52,770	188,496	101,571	357,884	154,666	318,556
Total.....		2,276,759		3,073,528		2,838,912

Table 67.—Principal Statistics of the Mineral Industry of Manitoba, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates and other minerals shipped from mines
			\$		\$	\$	\$
1923.....	29	30	5,776,757	629	680,183	328,521	1,767,811
1924.....	24	25	7,973,261	541	612,891	268,250	1,534,193
1925.....	26	26	4,948,621	699	711,735	315,005	2,275,772
1926.....	31	32	10,636,439	780	911,424	442,998	3,069,571
1927.....	33	33	11,780,120	1,007	1,232,805	590,225	2,888,895

NOTE.—The difference between the net values shown above, and those given in the next preceding table, is in the figures for gold. While the figures given above represent receipts from sales, the gold figures in the next preceding table represent receipts by the Royal Mint during the year, value at the standard rate for gold of \$20.671834 per fine ounce.

Table 68.—Number of Plants and Capital Employed in the Mineral Industry of Manitoba by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz	3	3,413,091	79,209	211,497	3,703,797					
Copper-gold-silver.....						3	487,043	36,971		524,014
Clay products.....	6	116,884	62,308	54,400	233,592	4	85,865	90,257	41,337	217,459
Lime.....	4	522,217	19,229	22,586	564,032	4	466,544	30,879	8,326	505,749
Sand and gravel..	10	266,015	5,505	66,499	338,019	10	292,549	7,200	82,108	381,857
Stone.....	4	288,553	25,505	40,087	354,145	6	292,396	33,709	163,818	489,923
†All other mines.	5	4,460,228	403,833	578,793	5,442,854	6	8,155,689	409,605	1,095,824	9,661,118
Total....	32	9,066,988	595,589	973,862	10,636,439	33	9,780,086	608,621	1,391,413	11,780,120

†Includes data for 1 gypsum quarry, 2 cement plants and 2 natural gas wells in 1926; and for 1 auriferous quartz mine 1 gypsum quarry, 2 cement plants and 2 natural gas wells in 1927.

Table 69.—Employees, Salaries and Wages in the Mineral Industry of Manitoba, 1926 and 1927

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1926						\$	\$	\$
Auriferous quartz.....	9		94		103	25,109	146,686	171,795
Clay products.....	12	1	148	10	171	24,150	90,920	115,070
Lime.....	7		84		91	11,200	62,576	73,776
Sand and gravel.....	7		35		42	14,070	31,880	45,950
Stone.....	6	1	140		147	15,449	156,825	172,274
*All other mines.....	20	2	204		226	47,456	285,103	332,559
Total.....	61	4	705	10	780	137,434	773,990	911,424
1927								
Auriferous quartz.....			70		86	43,118	177,947	221,065
Copper gold-silver.....	16		93		104	19,350	91,536	110,886
Clay products.....	9	2	113		121	14,166	69,194	83,360
Lime.....	8		228		237	15,970	89,769	105,739
Sand and gravel.....	9		148		155	16,554	168,556	185,110
Stone.....	6	1	273		304	90,158	436,487	526,645
*All other mines.....	29	2						
Total.....	77	5	925		1,007	199,316	1,033,489	1,232,805

*See footnote to Table 68.

†See note page 30.

Table 70.—Wage-Earners in the Mineral Industry of Manitoba by Months, 1926 and 1927

Month	1926	1927
January.....	338	374
February.....	392	418
March.....	456	433
April.....	561	567
May.....	696	792
June.....	817	987
July.....	889	1,042
August.....	900	989
September.....	736	873
October.....	704	769
November.....	535	645
December.....	474	647

Table 71.—Fuel and Electricity Used in the Mineral Industry of Manitoba 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	33,695	270,152	32,699	250,417
(b) Imported.....	Ton			8,244	72,379
Anthracite coal.....	Ton	196	1,215	140	840
Lignite coal (a) Canadian.....	Ton	35	327		
(b) Imported.....	Ton				
Coke.....	Ton	52	2,186		
Gasoline.....	Imp. gal.	12,270	5,614	24,168	11,123
Kerosene.....	Imp. gal.			450	293
Fuel oil and diesel oil.....	Imp. gal.	300	39	7,760	4,845
Wood.....	Cord	19,062	91,326	29,803	151,984
Gas (a) Manufactured.....	M cu. ft.				
(b) Natural.....	M cu. ft.				
Other fuel.....					
Electricity purchased*.....	K.W.H.	12,637,679	72,139	15,190,222	98,844
Total.....			442,998		590,225
Electricity generated*—					
(a) For own use.....	K.W.H.			2,059,000	
(b) For sale.....	K.W.H.				

*In 1926 the record shows only total electricity used.

Table 72.—Power Employed in the Mineral Industry of Manitoba, 1926 and 1927

	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	22	840	16	725
Gasoline, gas and oil engines.....	7	94	8	140
<i>Total primary power.....</i>	<i>29</i>	<i>934</i>	<i>24</i>	<i>865</i>
Electric motors run by purchased power.....	147	7,375	171	8,354
Total power employed.....	176	8,309	195	9,219
Electric motors run by primary power in same plant.....			94	450
<i>Total electric motors.....</i>	<i>147</i>	<i>7,375</i>	<i>215</i>	<i>8,804</i>
Boilers.....	17	1,170	19	1,216

SASKATCHEWAN

Saskatchewan, the great grain-growing province of the Dominion, lies between Alberta and Manitoba. While the greatest development in this province so far has been in agriculture, there is each year an appreciable production of lignite coal, clays and clay products, sand and gravel, sodium sulphate, and occasionally other mineral products. Large clay deposits both of fire clay and of clay suitable for the manufacture of pottery, occur south of Moose Jaw and the economic development of these deposits on a great scale is only a matter of time. Large areas of unprospected territory in the northern part of the province are known to be underlain by the same Precambrian rocks that have proved mineral-bearing in other parts of Canada. In this territory, lode gold has been reported near Beaver lake, and iron and other metallic minerals near lake Athabasca. In connection with the sodium sulphate deposits, it may be noted that these occur as lakes which are solid at certain seasons, and mushy or even liquid at other times. Investigations have been carried on for several years by the *Mines Branch* at Ottawa to determine the commercial possibilities of these areas. Available tonnage has been blocked out and some deposits have been worked successfully. Shipments of sodium sulphate from Saskatchewan have reached Ontario points and the use of the natural sulphate has partially replaced the manufactured product in some fields. Development of the lignite deposits has progressed to a greater extent in Saskatchewan than the production of any other mineral in that area. Most of the mines are operated on a small scale, largely to meet the needs of the surrounding country, and many of them are worked only in the winter months, as the owners find it more profitable to grow wheat than to mine coal during the summer season.

Mineral production from the province of Saskatchewan amounted in value to \$1,455,225 in 1927, or more than in any other year since 1920. Coal is the most valuable mineral and at \$868,867 represented nearly 60 per cent of the total value of all minerals produced in the province during the year under review. Clay products and sand and gravel were produced in greater quantities than in 1926 and the quantity of sodium sulphate was less than in the preceding year. Volcanic dust production mainly for use in cleansing powders was greater than in 1926.

Capital employed in the mining industries of the province amounted to \$5,089,410, the greater part being invested in the lands, buildings and plants of coal mines.

Employees totalled 1,112 people, 56 as salaried employees and 1,056 as wage-earners. Salaries paid amounted to \$106,337 and wages totalled \$749,367. Of the total number employed, 545 were working in and about the coal mines of the province, 355 in the sand and gravel industries and the remainder were engaged in the production of clay products, sodium sulphate and volcanic dust.

Fuel consumption, principally bituminous and lignite coal used under colliery boilers amounted to \$110,961.

Total primary power employed consisted of 37 units; 33 steam engines and 4 internal combustion engines, with a total manufacturers' rating of 2,382 h.p. There were 10 motors running on purchased power and 13 motors running on primary power generated by the same plant. Boilers numbered 27 with a total of 3,030 h.p.

Table 73.—Value of Mineral Production of *Saskatchewan, 1907-1927

Year	Value	Year	Value
	\$		\$
1907.....	533,251	1917.....	860,651
1908.....	413,212	1918.....	1,019,781
1909.....	456,246	1919.....	1,521,964
1910.....	498,122	1920.....	1,837,468
1911.....	636,706	1921.....	1,114,220
1912.....	1,165,642	1922.....	1,255,470
1913.....	881,142	1923.....	1,047,583
1914.....	712,313	1924.....	1,128,100
1915.....	451,933	1925.....	1,076,392
1916.....	590,473	1926.....	1,193,394
		1927.....	1,455,225

*Prior to 1907 the mineral production of Saskatchewan was grouped with Manitoba, Alberta and the Yukon.

Table 74.—Mineral Production of Saskatchewan, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
NON-METALLICS—						
Coal..... tons	471,935	870,875	439,803	819,805	470,216	898,867
Sodium sulphate..... tons	3,876	19,380	6,755	13,550	5,659	11,319
Volcanic dust..... tons	160	1,380	90	630	105	735
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		95,952		214,113		311,204
Sand and gravel..... tons	579,901	38,805	863,901	145,293	1,517,801	263,100
Total.....		1,076,392		1,193,394		1,455,225

Table 75.—Principal Statistics of the Mineral Industry of Saskatchewan, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of ore, coal and other minerals shipped from mines
			\$		\$	\$	\$
1923.....	78	78	4,747,582	738	760,392	65,274	1,027,971
1924.....	81	81	4,157,426	678	669,000	65,641	1,107,498
1925.....	68	68	3,732,909	652	647,014	91,025	1,055,139
1926.....	73	74	5,119,845	742	708,612	111,661	1,175,139
1927.....	72	72	5,089,410	1112	855,704	110,931	1,432,739

Table 76.—Number of Plants and Capital Employed in the Mineral Industry of Saskatchewan by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Coal.....	53	3,630,888	57,918	220,708	3,909,514	55	3,600,898	46,940	141,233	3,789,071
Clay products....	7	620,880	77,153	41,617	739,650	6	604,684	67,458	54,831	726,973
Sand and gravel..	7	39,750			39,750	5	54,750	2,000		56,750
†All other mines..	7	400,631	17,000	13,300	430,931	6	428,000	31,199	57,417	516,616
Total.....	74	4,692,149	152,071	275,625	5,119,845	72	4,688,332	147,597	253,481	5,089,410

† Includes data for 2 volcanic dust plants, 4 petroleum wells and 1 sodium sulphate plant in 1926; and for 1 sodium sulphate plant, 2 natural abrasives plants, and 3 petroleum wells in 1927.

Table 77.—Employees, Salaries and Wages in the Mineral Industry of Saskatchewan, 1926 and 1927

Industry	†Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1926					\$	\$	\$
Coal.....	42	3	470	515	77,435	455,256	532,691
Clay products....	15		146	161	23,113	65,332	88,445
Sand and gravel....	1		7	8	139	19,900	20,039
*All other mines.....	3	1	54	58	6,180	61,257	67,437
Total.....	61	4	677	742	106,867	601,745	708,612
1927							
Coal.....	34	2	509	545	71,060	482,022	553,082
Clay products....	13		141	154	26,477	100,820	127,297
Sand and gravel....	4		351	355	4,000	107,476	111,476
*All other mines.....	2	1	55	58	4,800	59,049	63,849
Total.....	53	3	1,056	1,112	106,337	749,367	855,704

*See footnote to Table 76.

†See note page 30.

Table 78.—Wage-Earners in the Mineral Industry of Saskatchewan, by Months, 1926 and 1927

Month	1926	1927
January.....	689	752
February.....	651	683
March.....	582	576
April.....	429	473
May.....	515	699
June.....	505	757
July.....	404	717
August.....	443	632
September.....	541	658
October.....	735	896
November.....	815	959
December.....	746	806

Table 79.—Fuel and Electricity Used in the Mineral Industry of Saskatchewan, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	4,279	35,340	4,902	38,783
(b) Imported.....	Ton				
Anthracite coal.....	Ton	29,039	39,948	35,111	46,058
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton				
Gasoline.....	Imp. gal.	1,980	651	1,680	487
Kerosene.....	Imp. gal.				
Fuel oil and diesel oil.....	Imp. gal.	320,023	30,081	293,151	23,472
Wood.....	Cord	433	2,226	154	937
Gas (a) Manufactured.....	M. cu. ft.				
(b) Natural.....	M. cu. ft.				
Other fuel.....					
Electricity purchased*.....	K.W.H.	220,175	3,415	37,674	1,224
Total.....			111,661		110,961
Electricity generated*—					
(a) For own use.....	K.W.H.			638,000	
(b) For sale.....	K.W.H.				

*In 1926 the record shows only total electricity used.

Table 80.—Power Employed in the Mineral Industry of Saskatchewan, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	36	2,113	33	2,180
Gasoline, gas and oil engines.....	5	203	4	202
<i>Total primary power.....</i>	<i>41</i>	<i>2,316</i>	<i>37</i>	<i>2,382</i>
Electric motors run by purchased power.....	1	25	10	73
Total power employed.....	42	2,341	47	2,455
Electric motors run by primary power in same plant.....	20	386	13	311
<i>Total electric motors.....</i>	<i>21</i>	<i>411</i>	<i>23</i>	<i>384</i>
Boilers.....	25	2,816	27	3,030

ALBERTA

The province of Alberta lies immediately east of British Columbia, the summit of the Rocky mountains marking its western boundary as far north as 54°, north latitude. From that point, northerly, the line follows the 120th meridian to Mackenzie district. Alberta is yet for the most part, a grazing and wheat-growing country, but the coal mines which are located in the area immediately to the east of the mountains, contribute largely to the mineral production of Canada. Natural gas is also of considerable importance in Alberta as a fuel for domestic and industrial purposes. Prospecting for oil has been carried on over considerable areas and some success has been attained. Gold is also known to occur in the gravels underlying some of the rivers.

As in Ontario, where the opening of mining areas followed the building of railroads, so also the construction of the Canadian Pacific Railway and the Canadian National Railway through the mountain led to the exploitation of the coal areas in Alberta. The famous Crowsnest pass, through which the southerly branch of the Canadian Pacific Railway transcontinental line runs, has coal within easy access from the railroad. Along the main line of the same railway which enters the mountains near Calgary and Banff, a large amount of work has also been done in the vicinity of Bankhead, and quantities of semi-anthracite coal have been produced, but these workings are closed down at the present time. The Canadian National Railway running west from Edmonton passes through coal areas for a considerable distance.

Deposits of bituminous sands in the northern part of the province along the Athabasca river have become of economic importance in recent years. Experimental work is being carried on by the *University of Alberta* at Edmonton, and by officials of the *Mines Department* at Ottawa, to promote the utilization of these sands.

Mineral production in the province of Alberta was valued at \$29,309,223 in 1927 as against \$26,977,027 in 1926.

Coal produced from 292 mines in 1927 amounted to 6,934,162 short tons valued at \$21,982,058 and represented 75 per cent of the total value of the mineral production of the province. Alberta mines produce three kinds of coal: bituminous, sub-bituminous and lignite. The output for 17 bituminous mines amounted to 2,984,513 tons valued at \$10,369,280; sub-bituminous mines numbering 24 produced 596,155 tons worth \$1,784,973; and 251 lignite properties yielded 3,353,494 tons worth \$9,827,805. In 1926 there were 316 coal mines with a total output of 6,503,705 tons valued at \$20,886,103.

Natural gas production in 1927 amounted to 13,434,621 thousand cubic feet worth \$3,586,533 as against 10,794,697 thousand cubic feet worth \$3,019,221 in the previous year, and the value of petroleum production increased from \$902,504 in 1926 to \$1,185,948 in 1927.

Cement output in 1927, amounting to 601,699 barrels worth \$1,303,880, showed a marked increase over the output of 1926. Clay products worth \$889,358 increased \$84,000 over the previous year. Lime output was slightly above the preceding year while the values of sand and gravel and stone were less.

Capital employed in the mining industry of the province amounted to \$105,203,514 in 1927 as against \$102,875,177 in 1926. Of this amount, \$87,484,050 represented the cost of lands, buildings, machinery and tools; \$2,800,773 the cost of supplies and stocks on hand; and \$14,918,691 the cash, trading and operating accounts and bills receivable. The capital employed in coal mines in 1927 represented 52.7 per cent of the total; natural gas 22.4 per cent; and oil wells 19.4 per cent. The remaining investments were in clay products plants, cement mills, salt wells, lime kilns, stone quarries and in sand and gravel pits and equipment.

The number employed totalled 11,205 persons; 806 were on salary and received \$1,785,184 for their services, and 10,399 were wage-earners who were paid \$13,914,120. Coal mining gave employment to 9,513, oil and gas wells 921, clay products 352, and other mines and quarries, 419. The trend of employment in Alberta is the reverse of most of the other provinces, since the greatest number are employed in winter months when the demand for coal is greater. Accordingly we find only an average of 8,088 people engaged in mining in May and 12,714 in December.

Fuel and electricity used in 1927 by the Alberta mining industries amounted to \$1,154,548 as against \$1,380,096 in the previous year. Bituminous and lignite coal consumption, the greater part of which was used under colliery boilers, accounted for 62 per cent of the total and electricity also used in large part by the coal mines represented 30 per cent.

Primary power equipment consisted of 306 steam engines with a total capacity of 36,081 h.p. and 88 internal combustion engines rated at 1,730 h.p. There were 554 motors with a combined horse power of 21,859 operating on purchased power and 367 motors rated at 10,168 h.p. running by power generated in the same plant. Boilers numbered 274, which, according to the manufacturers were rated at 32,070 h.p.

Table 81.—Value of Mineral Production of Alberta, 1907-1927

Year	Value	Year	Value
	\$		\$
1907.....	4,657,524	1917.....	16,527,535
1908.....	5,122,505	1918.....	23,109,987
1909.....	6,047,447	1919.....	21,087,582
1910.....	8,996,210	1920.....	33,586,456
1911.....	6,662,673	1921.....	30,562,229
1912.....	12,073,589	1922.....	27,872,136
1913.....	15,054,046	1923.....	31,287,536
1914.....	12,684,234	1924.....	22,344,940
1915.....	9,909,347	1925.....	25,318,866
1916.....	13,297,543	1926.....	26,977,027
		1927.....	29,309,223

Table 82.—Mineral Production of Alberta, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Gold.....fine oz.					42	868
Silver.....fine oz.					4	3
NON-METALLICS—						
Bituminous sands..... tons	1,148	4,594	528	2,112	2,706	10,824
Coal..... tons	5,869,031	20,021,484	6,503,705	20,886,103	6,934,162	21,982,058
Natural gas.....M cu. ft.	9,119,500	2,752,545	10,794,697	3,019,221	13,434,621	3,586,533
Petroleum..... bbl.	183,491	845,394	216,050	902,504	318,741	1,185,948
Salt..... tons	833	8,304	2,037	22,696	100	1,300
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... bbl.	395,857	913,529	423,766	873,621	601,699	1,303,880
Clay products.....		618,860		804,933		889,358
Lime..... bush.	98,938	39,852	108,309	39,517	130,596	46,947
Sand and gravel..... tons	534,892	107,436	1,754,965	412,430	1,392,752	293,674
Stone..... tons	3,979	6,868	3,759	13,890	3,367	7,830
Total		25,318,866		26,977,027		29,309,223

Table 83.—Principal Statistics of the Mineral Industry of Alberta, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of coal, oil, gas and other minerals shipped from the mines and wells
			\$		\$	\$	\$
1923.....	391	444	70,843,708	11,295	19,306,818	1,004,017	30,677,192
1924.....	387	446	87,003,765	8,716	13,684,225	991,549	21,750,278
1925.....	391	465	86,735,632	10,486	13,808,354	1,226,903	24,695,870
1926.....	425	473	102,875,177	10,733	14,499,210	1,380,096	26,351,728
1927.....	376	461	105,203,514	11,205	15,699,304	1,154,548	28,621,537

Table 84.—Number of Plants and Capital Employed in the Mineral Industry of Alberta by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Coal.....	316	47,302,986	1,049,581	7,724,990	56,077,557	292	46,611,981	1,072,809	7,759,852	55,444,642
Natural gas.....	84	22,489,214	430,437	3,190,735	26,110,386	86	21,175,361	213,521	2,195,359	23,584,241
Petroleum.....	43	13,869,772	283,052	1,293,586	15,446,410	45	15,193,332	929,954	4,302,394	20,425,680
Clay products....	9	1,340,153	358,469	284,749	1,983,371	10	1,526,693	298,665	454,067	2,279,425
Sand and gravel..	12	323,000	800	2,000	325,800	18	324,200	800	2,000	327,000
† All other mines.	9	2,428,583	305,370	197,700	2,931,653	10	2,652,483	285,024	205,019	3,142,526
Total	473	87,753,708	2,427,709	12,693,760	102,875,177	461	87,484,050	2,800,773	14,918,691	105,203,514

† Includes data for 1 salt well, 2 bituminous sands plants, 2 cement plants, 2 lime plants and 2 stone quarries in 1926; and for 1 salt well, 3 bituminous sands plants, 2 cement plants, 2 lime plants and 2 stone quarries in 1927.

Table 85.—Employees, Salaries and Wages in the Mineral Industry of Alberta, 1926 and 1927

Industry	Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1926						\$	\$	\$
Coal.....	619	38	8,667		9,324	1,525,006	11,120,594	12,654,600
Natural gas.....	72	20	248		340	187,652	327,693	515,345
Petroleum.....	43	29	408		480	87,362	564,616	651,978
Clay products.....	27	4	305	10	346	64,866	296,958	361,824
Sand and gravel.....	3		32		35	6,700	33,465	40,165
*All other mines.....	21	2	184	1	208	28,270	247,028	275,298
Total.....	785	93	9,844	11	10,733	1,899,856	12,599,354	14,499,210
1927								
Coal.....	549	32	8,932		9,513	1,371,969	12,166,597	13,538,566
Natural gas.....	73	18	206		297	174,947	251,179	426,126
Petroleum.....	63	22	539		624	146,277	836,620	982,897
Clay products.....	24	6	322		352	62,211	319,988	382,199
Sand and gravel.....	2		222		224	3,780	83,155	86,935
*All other mines.....	15	2	178		195	26,000	256,581	282,581
Total.....	726	89	10,399		11,205	1,785,184	13,914,129	15,699,304

*See footnote to Table 84.

†See note page 24.

Table 86.—Wage-Earners in the Mineral Industry of Alberta by Months, 1926 and 1927

Month	1926	1927
January.....	11,183	11,586
February.....	10,286	10,932
March.....	9,033	9,510
April.....	7,935	8,187
May.....	7,276	8,088
June.....	7,862	8,415
July.....	7,895	9,029
August.....	8,999	10,039
September.....	10,351	10,394
October.....	11,381	10,934
November.....	12,176	12,122
December.....	12,265	12,714

Table 87.—Fuel and Electricity Used in the Mineral Industry of Alberta, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	140,303	516,678	153,483	560,914
(b) Imported.....	Ton				
Anthracite coal.....	Ton	137,919	160,830	153,509	158,427
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton				
Gasoline.....	Imp. gal.	6,713	2,061	11,201	3,266
Kerosene.....	Imp. gal.			1,861	526
Fuel oil and diesel oil.....	Imp. gal.	264,783	13,862	22,848	944
Wood.....	Cord	1,737	6,885	1,625	7,663
Gas (a) Manufactured.....	M cu. ft.	1,579,336	38,364	1,372,562	69,588
(b) Natural.....	M cu. ft.				
Other fuel.....					
Electricity purchased*.....	K.W.H.	37,373,401	641,416	32,219,019	353,220
Total.....			1,380,096		1,154,548
Electricity generated*—					
(a) For own use.....	K.W.H.			11,042,349	
(b) For sale.....	K.W.H.			328,897	18,026

*In 1926 the record shows only total electricity used.

Table 88.—Power Employed in the Mineral Industry of Alberta, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	318	35,381	30	36,081
Gasoline, gas and oil engines.....	87	1,650	88	1,730
<i>Total primary power.....</i>	<i>405</i>	<i>37,031</i>	<i>394</i>	<i>37,811</i>
Electric motors run by purchased power.....	514	21,018	554	21,859
Total power employed.....	919	58,049	948	59,670
Electric motors run by primary power in same plant.....	349	9,591	367	10,168
<i>Total electric motors.....</i>	<i>863</i>	<i>30,609</i>	<i>921</i>	<i>32,027</i>
Boilers.....	268	31,364	275	32,070

BRITISH COLUMBIA

British Columbia, Canada's mountain province, has been associated with mining for many years. It is a province of mountains and valleys, swift running rivers and wide fertile tracts between the main ranges. It has an area of 355,855 square miles in extent, of which 353,416 square miles are land and 2,439 square miles are covered with water.

Broadly speaking there are three mountain systems, the Coast range, on the west, the Columbia system which includes the Cariboo, Selkirk and Purcell ranges in the centre and the Rocky Mountains on the east, the summit of the latter forming the provincial boundary of Alberta and British Columbia as far north as latitude 54°.

In the southerly sections of the province the main rivers are the Fraser, the Columbia and their tributaries, while farther north, the Skeena, the Stikene and the Nass and their tributaries empty into the Pacific ocean. The Peace river, which has its headwaters in the northeastern section, flows in a southeasterly direction and then north to Great Slave lake in Mackenzie district after which it joins the Mackenzie river by way of the Liard, and thence reaches salt water at the Arctic ocean.

Transportation which did so much to open up the southern section of the province when the Canadian Pacific Railway was built, has been greatly augmented in recent years by the construction of the Canadian National Railway to Prince Rupert, the Pacific Great Eastern from Squamish to Prince George, and the Canadian National down through the central sections of the province to tide-water at Vancouver.

In the year 1825 David Douglas, botanist, discovered galena on the eastern shore of Kootenay lake at what is now the Blue Bell mine. Ten years later, coal was found by Dr. W. F. Tolmie, at Fort Rupert, Vancouver Island, and in 1850 the existence of coal at Nanaimo was established by a Mr. J. W. McKay. This deposit was worked by the Hudson's Bay Company under the name of the Nanaimo Coal Company and shipments were made chiefly to San Francisco, California. The first discovery of gold was made at Gold Harbour on the west coast of the Queen Charlotte Islands about the year 1852 and during the same year, gold was found in the Similkameen country. A few years later or between 1855 and 1857 discoveries of gold were made on the Thompson, Fraser and Columbia rivers which precipitated the great Cariboo gold rush of 1858.

In 1861 gold was found on the Lightning and Williams Creeks and in the following year most of the other rich creeks in the Cariboo became known. Williams creek has yielded more gold than any other stream in British Columbia.

As soon as the easily-won gold began to show signs of depletion from the creek bottoms mining men commenced to prospect for minerals in place and the first recorded production of copper was made in 1888-1889 from the Hall mines near Nelson and this was followed in 1891 by a small shipment of copper ore from Rossland. Other discoveries followed in the Boundary country, in the Slocan, on the coast, and in East Kootenay. Today, British Columbia has in the Sullivan mine the largest lead-zinc mine in the British Empire, leads all other provinces in copper and silver production and stands second in gold.

Coal is the province's most important non-metallic mineral. It is found in abundance on the east coast of Vancouver island, in the southwestern portion of the province, and also to a less extent in small detached basins in the northern section of the province. Other non-metallics produced are quartz, pyrites, fluorspar, natro-alunite, pulpstones, sodium carbonate, talc, iron oxides and gypsum.

As arranged, at the time British Columbia joined Confederation, all geological work and mapping is done by the Dominion Government, and parties are sent annually to British Columbia for this purpose. The *Provincial Department of Mines* assists very materially in the opening up and development of prospects and mines. The province is divided into six mining districts, each supervised by a resident engineer, whose duty it is to carry on mineral surveys and to assist prospectors and others with such advice as may be necessary and may come within the scope of a mining engineer's work.

Among the outstanding mines of British Columbia are the Premier mine, a gold and silver property situated at the northerly end of the Portland canal in northern British Columbia, and the Sullivan mine, a rich lead and zinc deposit, at Kimberley in East Kootenay, owned and operated by the Consolidated Mining and Smelting Company of Canada, Limited. Leading copper properties, operated by the Granby Consolidated Mining, Smelting and Power Company of Anyox on the Portland canal in northern British Columbia, and by the Britannia Mining and Smelting Company on Howe Sound, a short distance north of Vancouver, contributed largely to the copper production of the province. Many silver-lead-zinc mines of the Slocan district that have been operated intermittently for a number of years, have given been a new lease of life recently because of the developments in smelter practice at Trail.

The Premier mine was finally brought to the producing stage and into the dividend class by the *American Smelting and Refining Company, Limited*, who acquired the controlling interest in this mine in the fall of 1919.

The Nickel Plate mine at Hedley in the Similkameen Valley is of interest as it is the only property in the province credited as being a producer of arsenic. The ore from this mine is concentrated and cyanided, the concentrates being shipped to Tacoma for treatment. Payment is made for some of the arsenic as well as for the gold content. Gold bullion from this mine is shipped to the Dominion Government Assay Office at Vancouver.

The value of mineral production of British Columbia, amounted to \$60,801,170 in 1927. The quantity of the principal metals produced in 1927 was greater but lower market values for lead, zinc, silver and copper reflected in the total value of the production of the provinces for the year.

Lead production at 292,770,544 pounds showed an improvement over 1926 by 9 per cent but the value recorded was less than in the previous year.

Zinc output amounted to 148,306,479 pounds worth \$9,186,103 as against 137,033,929 pounds valued at \$10,154,214 in 1926. Copper production at 91,686,297 pounds was greater than the 1926 output, and the silver production of 11,040,445 ounces exceeded the preceding year by 4 per cent. More lead, zinc, copper and silver were produced in British Columbia in 1927 than in any previous year. Gold output was lower than in 1926 and arsenic which is a by-product of the gold concentrates shipped to Tacoma by the Nickel Plate mine was slightly more than in 1926.

Coal production during 1927 showed an increase over 1926 as did nearly all other non-metallic minerals in this province.

In the structural materials group only clay products and stone showed increases over the previous year.

Capital employed in the mining and smelting industries of British Columbia amounted to \$114,129,277 of which \$90,253,627 was invested in lands, buildings, machinery and tools; \$10,412,437 in supplies and stocks on hand; and \$13,463,213 in cash trading and operating accounts and bills receivable. The 1926 investment totalled \$108,594,954 of which \$87,259,607 was invested in lands, buildings, etc.; \$10,372,803 in supplies and stocks on hand; and \$10,962,544 in cash, trading and operating accounts and bills receivable. Of the total for 1927, 12 per cent was invested in gold mines; 9 per cent in copper-gold-silver mines; 16 per cent in silver-lead-zinc-mines; 25 per cent in coal mines; and the remainder among the metallurgical works and smaller mining industries of the province.

Employment was given to 1,503 people whose salaries and wages amounted to \$22,714,957. There were 935 people on salary who were paid \$2,277,246 and 14,096 wage-earners who received \$20,437,711 in wages during the year.

Coal mining gave employment to 5,293 people, silver-lead-zinc mining 2,156, copper-gold-silver mining 2,360, metallurgical works 3,104, and the remainder were engaged in the clay products industries, cement plants, lime kilns, stone quarries, gravel pits, and other lesser mining operations.

The cost of fuel and electric power used in 1927 amounted to \$4,966,446 of which \$1,501,189 was paid for bituminous coal, \$926,569 for coke, and \$2,047,963 for electric power. Fuel oil valued at \$294,885 and minor quantities of anthracite coal, lignite coal, gasoline, gas and wood were also used. Of the total coal consumed, more than one-half was used by coal mines, and the greater part of the remainder by silver-lead-zinc mines, smelters and cement plants. The metallurgical industry used more than 70 per cent of the total electric power, though substantial quantities were utilized by the copper-gold mines, the silver-lead-zinc mines and the coal mines.

Primary power equipment consisted of 179 steam engines rated at 40,066 h.p.; 84 internal combustion engines rated at 5,305 h.p.; and 79 hydraulic turbines or water wheels with a capacity of 41,485 h.p. There were 2,046 motors with a rated capacity of 86,251 h.p. running on purchased power and 812 motors rated at 38,466 h.p. running on power generated by the establishment. Boilers with a rated capacity of 28,415 h.p. numbered 195.

Table 89.—Value of Mineral Production of British Columbia, 1899-1927

Year	Value	Year	Value
	\$		\$
1899.....	12,482,605	1913.....	28,086,312
1900.....	16,680,526	1914.....	24,164,039
1901.....	20,531,833	1915.....	28,689,425
1902.....	17,448,031	1916.....	39,969,962
1903.....	17,899,147	1917.....	36,141,926
1904.....	19,325,174	1918.....	42,935,353
1905.....	22,386,008	1919.....	34,865,427
1906.....	25,299,600	1920.....	39,411,728
1907.....	25,656,056	1921.....	33,230,460
1908.....	23,704,035	1922.....	39,423,962
1909.....	22,479,006	1923.....	43,757,388
1910.....	24,478,572	1924.....	52,298,533
1911.....	21,299,305	1925.....	64,485,242
1912.....	30,076,635	1926.....	65,622,976
		1927.....	60,801,170

Table 90.—Mineral Production of British Columbia, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Arsenic..... lb.	1,277,696	16,978	1,019,200	11,262	1,231,790	13,611
Copper..... lb.	69,221,600	9,720,097	89,108,017	12,292,450	91,686,297	11,845,870
Gold..... fine oz.	219,227	4,531,824	225,866	4,669,065	183,094	3,784,889
Iron, pig, from Canadian ore..... tons						
Lead..... lb.	242,454,502	22,111,850	266,812,461	18,012,509	292,770,544	15,388,020
Platinum..... fine oz.	6	715	50	4,258	11	960
Silver..... fine oz.	8,579,458	5,925,403	10,625,816	6,599,376	11,040,445	6,223,499
Zinc..... lb.	99,152,966	7,557,439	137,033,929	10,154,214	148,306,479	9,186,103
NON-METALLICS—						
Coal..... tons	2,742,252	11,720,373	2,613,719	10,612,915	2,746,243	10,934,777
Fluorspar..... tons	3,874	19,034				
Grindstones, pulpstones..... tons	481	27,781	700	45,116	380	27,600
Gypsum..... tons	240	865	20,916	156,964	24,493	201,754
Iron oxides..... tons	133	2,740	108	920	194	1,350
Natro-alunite..... tons	20	1,000			7	248
Phosphate..... tons					38	494
Pyrites..... tons	2,670	13,350	3,374	16,870	37,379	149,516
Quartz..... tons	853	2,262	6,466	77,060	20,859	80,824
Sodium carbonate..... tons	1,120	8,140	595	5,370	805	9,995
Talc..... tons	92	1,589			107	2,620
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	485,185	1,151,344	544,863	1,239,018	523,931	1,182,552
Clay products.....		523,931		592,495		679,788
Lime—						
Quicklime..... bush.	515,058	304,223	503,033	317,733	462,147	279,230
Hydrated..... tons	4,718	60,212	7,896	99,149	7,936	97,453
Sand and gravel..... tons	1,415,232	446,896	1,486,254	357,985	1,379,143	342,021
Stone..... tons	256,226	337,196	253,061	358,247	256,553	367,996
Total.....		64,485,242		65,622,976		60,801,170

Table 91.—Net Income from Sales from the Mineral Industry of British Columbia, 1926 and 1927. (Quantities shown are final shipments during the year: except as noted, values given are those reported as received f.o.b. shipping point.)

	1926		1927	
	Quantity	Value	Quantity	Value
GOLD MINING INDUSTRY—		\$		\$
Auriferous Quartz Mining Industry—Crude bullion..... oz.	57,209	525,052	23,571	326,314
Ore..... tons	127,068	2,097,631	96,773	1,880,465
Concentrates..... tons	21,614	1,876,462	27,835	1,459,551
Slags and residues.....		1,080		
Dry ore and precipitates..... tons	962	96,045		
Total for auriferous quartz mining industry.....		4,096,270		3,666,330
ALLUVIAL GOLD MINING INDUSTRY—				
Crude bullion, including gold, silver and platinum..... fine oz.	20,962	352,435	9,212	153,892
COPPER-GOLD-SILVER MINING INDUSTRY—				
Ore..... tons	664,751	2,406,239	329,587	1,644,727
Concentrates..... tons	164,577	7,234,994	238,653	7,751,340
Slags and residues..... tons	220	25,900	409	21,711
Other..... tons	56	5,895	158	13,369
Total for copper-gold-silver mining industry.....		9,673,028		9,431,147
SILVER-LEAD-ZINC MINING INDUSTRY—				
Lead ore..... tons	64,696	2,646,294	66,692	1,515,119
Lead concentrates..... tons	170,313	12,799,797	192,674	9,513,937
Zinc ore..... tons	52,507	982,358	1,861	48,367
Zinc concentrates..... tons	174,265	6,957,948	181,123	3,603,719
Dry ore..... tons	5,938	152,559	10,637	79,278
Total for silver-lead-zinc mining industry.....		23,538,956		14,760,420
METALLURGICAL WORKS.—				
Smelter and refinery sales, less estimated cost of ores, etc., treated.....		9,520,480		16,391,940
(Products: Gold, silver, refined copper, blister copper, copper sulphate, lead, zinc and base bullion.)				
Total:—				
(a) Metal mining and metallurgical works listed above.....		47,181,169		44,403,729
(b) Non-metal mining industries including fuels.....		*10,915,215		10,667,060
(c) Clay products and other structural materials as per Table 90.....		2,964,627		2,949,040
Grand total.....		61,061,011		58,019,829

† Includes pyrite concentrates in 1927.

• See Table 90.

Table 92.—Principal Statistics of the Mineral Industry of British Columbia, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, coal, and other minerals shipped from mines smelters and quarries
			\$		\$	\$	\$
1923.....	153	163	97,357,573	12,105	19,913,678	3,682,428	37,746,729
1924.....	159	194	107,611,494	12,422	19,876,613	3,770,384	47,573,693
1925.....	161	193	107,257,567	13,727	21,440,904	4,801,665	54,160,830
1926.....	226	272	108,594,954	14,566	21,556,415	4,913,255	60,367,481
1927.....	282	329	114,129,277	15,031	22,714,937	4,936,446	58,019,829

Table 93.—Number of Plants and Capital Employed in the Mineral Industry of British Columbia by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Alluvial gold.....	28	505,668	975	6,568	513,211	38	1,008,230	55,183	65,646	1,129,059
Auriferous quartz	12	9,265,342	488,081	816,645	10,570,068	16	12,337,471	528,631	927,873	13,793,975
Copper-gold-silver.....	21	8,343,600	325,636	847,381	9,516,617	31	7,620,498	495,548	2,918,683	11,034,729
Silver-lead-zinc..	115	1,082,253	641,789	3,843,832	15,567,874	146	13,249,200	951,370	4,013,926	18,214,496
Coal.....	33	29,138,472	802,609	2,146,252	32,087,333	35	25,409,332	845,139	2,053,485	28,307,956
Clay products....	12	838,399	121,075	71,182	1,030,656	10	895,171	184,543	108,595	1,188,309
Lime.....	3	1,002,481	51,598	119,360	1,173,439	3	1,102,043	86,227	129,542	1,317,812
Sand and gravel..	9	1,012,471	4,455	16,320	1,033,246	9	1,047,632	28,518	19,282	1,095,432
Stone.....	19	459,340	46,881	34,272	540,493	20	591,363	54,480	37,758	683,601
†All other mines and smelters...	20	25,611,581	7,889,704	3,060,732	36,562,017	21	26,992,687	7,182,798	3,188,423	37,363,908
Total.....	272	87,259,607	10,372,803	10,962,544	108,594,954	329	90,253,627	10,412,437	13,463,213	114,129,277

†Includes data for 2 smelters, 5 gypsum mines, 2 iron oxide mines, 1 grindstone quarry, 2 quartz quarries, 1 cement plant, 2 iron pyrites mines, and 5 sodium carbonate properties in 1926; and for 2 smelters, 4 gypsum mines, 2 iron oxide mines, 3 quartz quarries, 1 mica mine, 2 talc and soapstone quarries, 1 natro-alunite mine, 1 phosphate plant, 1 iron pyrites mine, 1 cement plant, 1 natural abrasives plant and 2 sodium carbonate properties in 1927.

Table 94.—Employees, Salaries and Wages in the Mineral Industry of British Columbia, 1926 and 1927

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1926						\$	\$	\$
Alluvial gold.....	6		92		98	14,089	90,635	104,724
Auriferous quartz.....	84	2	643	3	732	164,219	1,155,748	1,319,967
Copper-gold-silver.....	111	8	2,042	19	2,180	288,912	2,907,463	3,196,375
Silver-lead-zinc.....	137	4	2,103	15	2,259	307,855	3,135,628	3,443,483
Coal.....	217	20	5,095		5,332	569,789	6,544,118	7,113,907
Clay products.....	21	2	307		330	43,142	266,432	309,574
Lime.....	9	3	132		144	16,497	123,588	140,085
Sand and gravel.....	11	1	72		84	25,866	95,514	121,380
Stone.....	12	1	166		179	28,100	184,837	212,937
*All other mines and smelters	275	20	2,933		3,228	673,041	4,920,942	5,593,983
Total.....	883	61	13,585	37	14,566	2,131,510	19,424,905	21,556,415
1927								
Alluvial gold.....	8	1	158		167	15,384	146,233	161,617
Auriferous quartz.....	41	3	578	2	624	136,313	922,700	1,059,013
Copper-gold-silver.....	119	5	2,216	20	2,360	337,451	3,201,802	3,539,253
Silver-lead-zinc.....	144	5	1,990	17	2,156	329,476	3,091,021	3,420,497
Coal.....	239	16	5,038		5,293	630,871	6,910,810	7,541,681
Clay products.....	20	2	296		318	49,563	291,045	340,608
Lime.....	10	3	129		142	18,309	128,995	147,304
Sand and gravel.....	11	1	337		349	27,925	142,628	170,553
Stone.....	10		152		162	23,915	160,447	184,362
*All other mines and smelters	270	27	3,163		3,460	708,039	5,442,030	6,150,069
Total.....	872	63	14,057	39	15,031	2,277,216	20,437,711	22,714,957

*See footnote to Table 93.

†See note p. 30.

Table 95.—Wage-Earners in the Mineral Industry of British Columbia, by Months, 1926 and 1927

Month	1926	1927
January.....	12,732	12,938
February.....	12,686	12,956
March.....	12,692	13,347
April.....	12,568	13,606
May.....	13,013	13,628
June.....	13,077	13,665
July.....	12,925	13,508
August.....	13,272	13,576
September.....	13,358	13,766
October.....	13,775	13,769
November.....	13,680	13,453
December.....	13,036	12,716

Table 96.—Fuel and Electricity Used in the Mineral Industry of British Columbia, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
Bituminous coal (a) Canadian.....	Ton	316,848	1,325,831	347,895	1,501,189
(b) Imported.....	Ton				
Anthracite coal.....	Ton	482	3,981	543	4,525
Lignite coal (a) Canadian.....	Ton	45	360	3,650	23,206
(b) Imported.....	Ton				
Coke.....	Ton	102,525	1,054,479	89,814	926,569
Gasoline.....	Imp. gal.	88,047	22,582	68,055	22,606
Kerosene.....	Imp. gal.			7,551	1,981
Fuel oil and diesel oil.....	Imp. gal.	2,310,660	177,490	4,216,509	294,885
Wood.....	Cord	26,453	86,181	30,520	102,106
Gas (a) Manufactured.....	M cu. ft.	364,725	50,886	293,038	39,560
(b) Natural.....	M cu. ft.				
Other fuel.....					1,856
Electricity purchased*.....	K.W.H.	497,867,269	2,191,465	468,439,247	2,047,963
Total.....			4,913,255		4,966,446
Electricity generated*—					
(a) For own use.....	K.W.H.			93,874,502	
(b) For sale.....	K.W.H.			5,573,269	102,343

*In 1926, the record shows only total electricity used.

Table 97.—Power Employed in the Mineral Industry of British Columbia, 1926 and 1927

Kind	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	178	32,415	179	40,036
Gasoline, gas and oil engines.....	66	4,060	84	5,305
Hydraulic turbines and water wheels.....	74	42,595	79	41,485
<i>Total primary power.....</i>	<i>318</i>	<i>79,070</i>	<i>342</i>	<i>86,826</i>
Electric motors run by purchased power.....	1,231	87,079	2,046	86,251
Total power employed.....	1,549	166,149	2,388	173,107
Electric motors run by primary power in same plant.....	817	38,762	812	38,466
<i>Total electric motors.....</i>	<i>2,048</i>	<i>125,841</i>	<i>2,858</i>	<i>124,717</i>
Boilers.....	155	18,637	195	28,415

THE YUKON

The Yukon Territory lies in the extreme northwest section of the Dominion of Canada. Immediately to the west is Alaska, and on the east, the Mackenzie district, while the province of British Columbia is adjacent to the greater part of its southern boundary. Alaska was originally owned by Russia, and it comprised that territory lying west of the present Yukon Territory, and a section of the western coast down as far as a long narrow inlet known as the Portland Canal. Russia claimed the north Pacific coast down to latitude 51° N, but in the treaty of 1824 the boundary was fixed at 54° 40' N, and in the following year a treaty was concluded by which Russia relinquished to Great Britain her claim, not only to the region below 54° 40' N, but also to the vast interior occupied by the Hudson's Bay Company up to the frozen ocean. In 1825, the southern and western boundaries of the British possessions were established, but owing to certain ambiguity, the boundary between what are now British Columbia and Alaska, was not very well established. In 1867, Alaska was purchased from Russia by the United States. In the summer of 1896, alluvial gold was found in the Yukon District, and immediately a section of the North American continent which up to this time had been considered of little economic value, became the cause of serious controversy between Canada and the United States because of the doubt as to the proper location of the boundary line of Alaska. Finally, the question was settled in 1903 by the award of the *Alaska Boundary Tribunal*.

The main rivers of this territory are the Peel, the Porcupine, the Yukon and its tributaries such as the White river, the Stewart river and the Pelly. Dawson City, which had a population of 9,142 during the gold boom, is occupied now by 975 people. There is one railroad, the White Pass and Yukon, which runs from Skagway, Alaska, northerly to White Horse. From there, passengers embark on the river boats and go down the Yukon river to Dawson City. The railroad was constructed along the route most travelled during the days in which the early prospectors were entering the territory.

When the news of the wonderful gold discoveries reached the outside world, men from all walks of life flocked to this new district, and the stories of the hardships of the life have been told in prose and verse by Robert W. Service, a young bank clerk who lived through the days when Dawson City was at its height.

Between 1898 and 1905 upwards of \$100,000,000 in gold was taken from the gravels of Bonanza, Eldorado, Hunker, Dominion and Sulphur Creeks and their tributaries. Many of the famous creek claims on Bonanza and Hunker are now being worked by the dredging process, and the terraces of the equally famous White Channel are being washed down by hydraulic methods.

Since 1905, production of gold has gradually decreased; in 1919, the output was valued at about \$1,900,000 and in 1927 at \$639,483. Although there are a great many individual miners, the report of their production is not very extensive and the greater part of the gold is recovered by large hydraulic or dredging companies.

Of late years, the Mayo district on the Stewart river has come into prominence because of the silver-lead ore discovered there. The ore is mined under difficult climatic conditions, and is taken down to the river and piled there ready for transportation to the smelters when navigation opens. Because of the high cost entailed in shipping this ore to the smelter, only high-grade material can be transported economically, and in order to prepare lower grade ore for shipping, the Treadwell Yukon Mining Company, Limited, has constructed a concentrator where custom ore as well as their own is treated.

Other economic minerals such as copper and antimony are known to occur but up to the present time there has been no report of production.

Among the non-metallic minerals, coal is the only one of any importance and it is known to occur in the Yukon in at least eighteen distinct areas. In thirteen of these, coal of economic importance has been discovered. The production, however, has been small, partly because there has been little demand for coal and partly because only very few of the properties are conveniently situated for shipping purposes.

Silver production, almost all of which was recovered from the silver-lead mines of the Mayo district, although small quantities are obtained in association with alluvial gold, amounted to \$928,580 or 52 per cent of the total mineral production of the territory for the year. Lead output at \$218,929 was less than that of the previous year; gold production at \$639,483 was 20 per cent greater than the total for 1926 and the output of coal was larger also.

Capital employed amounted to \$10,946,398. There were 301 people reported as being employed in mining who were paid \$691,476. Of these, 147 consisting of 10 salaried employees and 137 wage-earners were working at silver-lead mining and coal mining and received \$380,497 for their services; 154 found work in alluvial gold operations and were paid \$310,979 in salaries and wages. There were other alluvial miners who worked individual claims but it was found very difficult to get returns from all of them as they are men of no fixed post office address.

Fuel consumed was valued at \$96,974 nearly one-quarter of which was spent for electric power; fuel oil valued at \$54,347, gasoline at \$8,198, wood at \$10,006, and coal, a large part of which was blacksmith's coal worth \$1,913, were also used.

Primary power equipment consisted of one steam engine rated at 100 h.p. and 3 internal combustion engines with a total capacity of 345 h.p. There were 20 motors rated at 213 h.p. run by primary power made by the same plant. The boilers numbered 2 with a combined rating of 115 h.p.

Table 98.—Value of Mineral Production of the Yukon,* 1907-1927

Year	Value	Year	Value
	\$		\$
1907.....	3,335,898	1917.....	4,482,202
1908.....	3,669,290	1918.....	2,355,631
1909.....	4,032,678	1919.....	1,940,934
1910.....	4,764,474	1920.....	1,576,726
1911.....	4,707,432	1921.....	1,754,955
1912.....	5,933,242	1922.....	1,785,573
1913.....	6,276,737	1923.....	2,972,823
1914.....	5,418,185	1924.....	952,812
1915.....	5,057,708	1925.....	1,791,641
1916.....	5,491,610	1926.....	2,226,813
		1927.....	1,769,044

* Prior to 1907 the mineral production of the Yukon was included with the provinces of Manitoba, Saskatchewan and Alberta.

Table 99.—Production of Gold of the Yukon, 1885-1927

Year	Fine ounces *	Value	Year	Fine ounces *	Value	Year	Fine ounces *	Value
		\$			\$			\$
1885).....	4,837	100,000	1900.....	1,077,553	22,275,000	1914.....	247,940	5,125,374
1886/.....			1901.....	870,750	18,000,000	1915.....	230,173	4,758,098
1887.....	3,386	70,000	1902.....	701,437	14,500,000	1916.....	212,700	4,396,900
1888.....	1,935	40,000	1903.....	592,594	12,250,000	1917.....	177,667	3,672,703
1889.....	8,466	175,000	1904.....	507,938	10,500,000	1918.....	102,474	2,115,325
1890.....	8,466	175,000	1905.....	381,001	7,876,000	1919.....	90,705	1,875,039
1891.....	1,953	40,000	1906.....	270,900	5,600,000	1920.....	72,778	1,504,455
1892.....	4,233	87,500	1907.....	152,381	3,150,000	1921.....	65,994	1,364,217
1893.....	8,514	176,000	1908.....	174,150	3,600,000	1922.....	54,456	1,125,705
1894.....	6,047	125,000	1909.....	191,565	3,960,000	1923.....	60,144	1,243,287
1895.....	12,094	250,000	1910 (a).....	221,091	4,570,362	1924.....	34,825	719,897
1896.....	14,513	300,000	1911.....	224,197	4,634,574	1925.....	47,817	988,465
1897.....	120,937	2,500,000	1912.....	268,447	5,549,296	1926.....	25,601	529,220
1898.....	483,750	10,000,000	1913.....	282,838	5,846,780	1927.....	30,935	639,483
1899.....	774,000	16,000,000				Total.....	8,824,182	182,411,630

(*) Calculated from the value: one dollar=0.048375 ounces.

(a) Includes a small production from lode mines, from 1910 to 1927 inclusive.

Table 100.—Mineral Production of the Yukon, 1925-1927

Product	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Gold.....fine oz.	47,817	988,465	25,601	529,220	30,935	639,483
Lead.....lb.	1,875,442	171,040	5,860,373	395,634	4,165,331	218,929
Silver.....fine oz.	904,893	624,964	2,095,027	1,801,159	1,647,295	928,580
NON-METALLICS—						
Coal.....tons	730	7,172	316	800	414	2,052
Total.....		1,791,641		2,226,813		1,789,044

Table 101.—Net Income from Sales of Products, from the Mineral Industry of the Yukon, 1926 and 1927 (Quantities shown are final shipments during the year: values given are those reported as received f.o.b. shipping point)

Industry and Product	1926		1927	
	Quantity	Value	Quantity	Value
		\$		\$
ALLUVIAL GOLD MINING INDUSTRY—				
Crude bullion.....crude oz.	31,680	527,451	38,073	640,141
Total for alluvial gold mining industry.....crude oz.	31,680	527,451	38,073	640,141
SILVER-LEAD-ZINC MINING INDUSTRY—				
Lead ore.....tons	2,617	262,152	1,402	175,816
Lead concentrates.....tons	2,729	916,217	2,686	767,980
Dry ore.....tons			58	12,752
Total for silver-lead-zinc mining industry.....tons	5,346	1,222,379	4,146	956,548
Total:—				
(a) Metal mining industries listed above.....		1,749,820		1,596,639
(b) Non-metal mining industries.....		*800		2,037
Total.....		1,750,620		1,598,726

*See Table 80.

Table 102.—Principal Statistics of the Mineral Industry of the Yukon, 1923-1927

Year	Number of active operators	Number of operating mines and alluvial claims	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, and coal shipped from the mines
			\$		\$	\$	\$
1923.....	144	1,474	13,095,474	469	804,761	131,745	2,124,702
1924.....	92	1,409	24,491,850	391	666,603	117,846	785,675
1925.....	101	1,422	24,456,425	462	527,090	171,627	1,737,765
1926.....	85	1,156	6,560,124	375	578,958	254,474	1,750,600
1927.....	74	76	10,946,398	301	691,476	96,974	1,593,726

Table 103.—Number of Plants and Capital Employed in the Mineral Industry of the Yukon, by Classes and by Industries, 1926 and 1927

Industry	1926					1927				
	Capital employed as represented by					Capital employed as represented by				
	Number of plant	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Alluvial mines....	1,151	100,000	170,687	3,918,910	4,189,597	58	7,778,121	200,163	546,380	8,524,664
*Silver-lead and coal mines.....	5	1,820,127	276,835	273,565	2,370,527	18	1,573,100	691,609	157,025	2,421,734
Total.....	1,156	1,920,127	447,522	4,192,475	6,560,124	76	9,351,221	891,772	703,405	10,946,398

* Includes data for 1 coal mine.

Table 104.—Employees, Salaries and Wages in the Mineral Industry of the Yukon, 1926 and 1927

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1926					\$	\$	\$
Alluvial mines.....	4	2	181	187	20,000	215,117	235,117
Silver-lead and coal mines.....	18	2	168	188	41,875	301,966	343,841
Total.....	22	4	349	375	61,875	517,083	578,958
1927							
Alluvial mines.....	8	2	144	154	28,811	282,168	310,979
Silver-lead and coal mines.....	9	1	137	147	36,670	343,827	380,497
Total.....	17	3	281	301	65,481	625,995	691,476

*See note page 30.

Table 105.—Wage-Earners in the Mineral Industry of the Yukon, by Months, 1926 and 1927

Month	1926	1927
January.....	143	142
February.....	151	143
March.....	157	147
April.....	229	138
May.....	275	185
June.....	318	258
July.....	313	301
August.....	320	315
September.....	309	284
October.....	266	266
November.....	226	221
December.....	178	138

Table 106.—Fuel and Electricity Used in the Mineral Industry of the Yukon, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	26	2,870	19	1,913
(b) Imported.....	Ton				
Anthracite coal.....	Ton				
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton				
Coke.....	Ton			5	74
Gasoline.....	Imp. gal.	41,071	41,515	10,059	8,198
Kerosene.....	Imp. gal.			500	418
Fuel oil and diesel oil.....	Imp. gal.	105,206	59,625	110,442	54,347
Wood.....	Cord	2,226	37,563	468	10,006
Gas (a) Manufactured.....	M cu. ft.				
(b) Natural.....	M cu. ft.				
Other fuel.....					
Electricity purchased*.....	K.W.H.	5,268,725	112,901	2,201,850	22,018
Total.....			254,474		96,974
Electricity generated*					
(a) For own use.....	K.W.H.			2,907,285	
(b) For sale.....	K.W.H.			3,814,720	58,294

*In 1926, the record shows only total electricity used.

Table 107.—Power Employed in the Mineral Industry of the Yukon, 1926 and 1927

	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and steam turbines.....	1	100	1	100
Gasoline, gas and oil engines.....	7	413	3	345
<i>Total primary power.....</i>	<i>8</i>	<i>513</i>	<i>4</i>	<i>445</i>
Electric motors run by purchased power.....			21	2,515
Total power employed.....	8	513	25	2,960
Electric motors run by primary power in same plant.....	20	213	20	213
<i>Total electric motors.....</i>	<i>20</i>	<i>213</i>	<i>41</i>	<i>2,728</i>
Boilers.....	6	189	2	115

CHAPTER THREE

THE GOLD MINING INDUSTRY IN CANADA

(With tables showing the production of gold)

1. General Review.
2. Reviews of the Gold Mining Industry in Canada by Areas.
3. The Alluvial Gold Mining Industry.
4. The Auriferous Quartz Mining Industry.
5. The Copper-Gold-Silver Mining Industry.
6. Commodity Statistics—including tables showing production by provinces, imports, exports, and world output of gold.

1. General Review

CANADA

(a) *Definition of the Industry.*—Canada's gold mining industry falls naturally into two main divisions: the winning of placer gold, or the Alluvial Gold Mining Industry, and the recovery of free-milling gold from auriferous quartz mines, described under the title The Auriferous Quartz Mining Industry. In the treatment of ores containing metals other than gold in commercial values, such as copper and silver, gold is often recovered as a by-product; in making up production figures, gold obtained from the treatment of Canadian ores of every kind, is included in the total. Most of the other lode mines producing gold in quantity are included in the group entitled Copper-Gold-Silver Mining Industry.

(b) *Historical.*—During the early history of the industry in Canada (1850-1890), most of the gold produced was obtained from placer deposits in the province of British Columbia. Later, in 1898, the famous Yukon placers were discovered, and for some time these deposits constituted the principal source of Canada's gold. More recently, developments in lode mining, however, have somewhat overshadowed the alluvial workings; as the alluvial yields declined, lode gold recoveries increased until they became the principal source of supply. During the past ten or eleven years the province of Ontario has come to the front as a gold-producer, through the development of the rich gold quartz mines of the Porcupine and Kirkland lake districts; the output from British Columbia mines has been fairly constant for several years; new fields, such as the Rouyn area of Quebec, with its large deposits of gold-bearing copper ore and various sections of northern Manitoba continue to attract the attention of the mining world.

(c) *Sources.*—In 1927 the auriferous quartz mines yielded 88·5 per cent of the total production; alluvial deposits provided 2 per cent; Canadian copper and lead smelters recovered 2·2 per cent; and gold obtained by foreign smelters in the treatment of Canadian ores of various kinds amounted to 7·3 per cent of the total Dominion production of gold.

(d) *Importance of the Industry.*—Among Canada's mineral products, gold holds second place in point of value, being surpassed only by coal. In 1927, gold represented 15·49 per cent of the total value of Canada's mineral output.

Steady progress, too, has been made by Canada as a world producer, and for the past six years, Canada has held third place; the Union of South Africa and the United States continue to hold first and second places, respectively. South Africa production provides more than half the world's output, while Canada produces nearly seven-eighths as much as the United States, almost three times as much as Australia, and more than one and one-half times as much as the continent of Asia.

2. Reviews of the Gold Mining Industry by Areas

NOVA SCOTIA

Gold, obtained mostly from free-milling ores, and partly from gold-bearing ores containing arsenic, continued to be one of Nova Scotia's important items of mineral production from about 1862 until 1903 and during these years many deposits were worked, the annual yields varying from 6,863 fine ounces in 1862 to 30,348 fine ounces in 1902, with an average production of possibly 20,000 ounces each year. In 1904, production dropped to 10,362 ounces, and the output held around this figure until 1910; since then there has been no appreciable revival in production and in 1927 the total output was only 3,151 ounces.

Nova Scotia possesses a large number of small gold lodes in quartzites and slates of Precambrian age. In places these yield very rich ore. They have been worked irregularly during the past sixty years and have made a total production little short of \$19,000,000. Several of these mines have been recently re-opened. There is renewed interest in the region and further activity may be expected. Hydro-electric power is now available in most parts of the province.

QUEBEC

So far, Quebec has not been a great producer of gold or gold-bearing ores, but recent work in the Rouyn field indicates that in the near future, this province will become of much more importance as a producer of metals, including gold, than it has ever been in the past. In reviewing the situation in Quebec, the fact that the ores of the Rouyn area are largely copper-gold, with some containing zinc as well, makes it necessary to consider the problem in connection with the production in other provinces from similar ores; this is done in the section on the Copper-Gold-Silver Industry.

Suffice it to say, here, that the production of gold in recent years from Quebec ores, has been recovered from silver-lead-zinc ores, usually exported for treatment.

ONTARIO

Ontario, with its rich mines in the Porcupine and Kirkland Lake areas, continued to hold the lead among the gold-producing provinces, contributing 87.8 per cent of the total gold production for Canada in 1927. In the same year Ontario's gold output represented 37.4 per cent of the aggregate value of the mineral production for the province.

Some idea of the phenomenal growth in gold mining in Ontario may be had from the facts that in 1903 the gold output of the province totalled only 9,096 ounces, or 1 per cent of the Canadian aggregate for this metal; in 1913, the output of 219,801 ounces made up 27.4 per cent of Canada's total production; while in 1927, as already noted, Ontario's share at 1,627,050 ounces, represented 87.8 per cent of the total gold produced from Canadian ores.

In 1927, there were in the Porcupine area, nine producing mines of importance, headed by the Hollinger, now one of the world's greatest mines. The others in order of their production values were: Dome, McIntyre, Vipond, Ankerite, Porcupine, Paymaster, Consolidated West Dome Lake, March Gold and Scottish Ontario.

Gold production from the Porcupine area amounted to 1,154,120 fine ounces or 71 per cent of the total for the province. To the end of 1927 the aggregate yield of gold from the Porcupine area reached a value of more than \$209,000,000.

Kirkland Lake, Ontario's second most important gold-producing area, discovered in 1911 and more actively developed since 1919, yielded 468,008 fine ounces in 1927. Lake Shore, Teck-Hughes and Wright-Hargreaves are the three principal producers. Others of importance in this camp are: Sylvanite, Tough Oakes, Burnside, Argonaut, Kirkland Lake and the Barry Hollinger of the Boston Creek camp, in addition to which there are many smaller properties being developed.

Several deposits within the area of the Porcupine and Kirkland Lake camps, although not producing, are being vigorously developed and may be expected to add to the general output. Discoveries of gold ores, made from time to time in many parts of this province also add greatly to the probability of increased production.

Late in 1925 some apparently important discoveries of gold were made following some earlier efforts, near Red Lake in the district of Patricia, Ontario. This place is near the Manitoba boundary line more than 100 miles north of the National Transcontinental Railway line and somewhat less distance east of Bull Dog lake in Manitoba. Several leading gold mining companies became seriously interested in the district and exploration work was carried on in 1926. Attention had already been called to the locality by the Geological Survey over thirty years ago and more recently by the Ontario Bureau of Mines. Geologically, the area is a Precambrian complex. Keewatin lavas and later sediments (conglomerate and slate) are intruded by granite and porphyry. Quartz veins occur, and lavas in contact with quartz porphyry intrusions are characteristically altered.

The knowledge and experience gained in the successful development of gold mining in Ontario during the past thirteen or fourteen years is now leading to re-examination of many localities that were unsuccessfully opened at earlier times especially those along the main line of the Canadian Pacific Railway north of the Great Lakes and in the district of the Lake of the Woods. The Goudreau and Michipicoten areas are among those which are receiving renewed attention. Well-known mining companies are engaged in exploration and development work and results so far obtained are reported as promising.

The producing gold deposits of Ontario occur under somewhat uniform conditions but with local variations. All are in the rock of Precambrian age and the principal producing deposits are associated with acid intrusives of Algonian age in volcanic or sedimentary rocks of earlier age.

Besides the production from Ontario's gold mines, an appreciable amount is obtained annually as a by-product from the nickel-copper ores of the Sudbury district. Gold from the International Nickel is obtained in the refining of the precious metals residues of the Port Colborne refinery and gold credited to the Mond Nickel is that recovered from the refinery at Clydach, Wales.

PRAIRIE PROVINCES

Manitoba, Saskatchewan and Alberta.—The major part of the settled portions of the prairie provinces, Manitoba, Saskatchewan and Alberta, is underlain by rocks of sedimentary origin and of comparatively late age. It is, therefore, not likely to contain deposits of the precious metals. Alluvial gold is found in the Saskatchewan river in Alberta, but its recovery has not been found profitable.

The northeastern part of each of these provinces, however, occupies a portion of the Laurentian plateau which is underlain by rocks of Precambrian age and in many places is favourable for the occurrence of gold or other valuable minerals.

In Alberta the Precambrian area is small, about 5,000 square miles, and as yet no gold occurrences have been reported from it. In Saskatchewan, it occupies about one-third of the province and in Manitoba it is still larger, comprising perhaps two-thirds of that province.

Near the margin of the Precambrian, adjacent to the Manitoba-Saskatchewan boundary, is an area known as The Pas district, in which gold, along with copper and pyrites, is found over a wide area, in bodies, some of which are large. A small amount of gold was recovered from some rich copper ores that were mined for a time at the Mandy mine in this district. Free milling gold was also mined for a time at the Rex mine, in the Herb or Wekusko lake district, eighty miles northeast of The Pas.

Other deposits of both classes of ore are found in the region and have received more or less development. Enormous deposits of copper-bearing pyrite at Flin Flon, one hundred miles north of The Pas also have an appreciable gold content; the property has been under investigation for some years and the prospects of its being worked soon are very favourable.

In Manitoba, east of Lake Winnipeg, prospecting has been carried on for as long as ten years. Numerous occurrences of free gold have been more or less developed in the vicinity of Rice, Gold, and Long Lakes, and more recently at Bull Dog Lake, near the Ontario boundary line.

The Central Manitoba mine began to operate a new mill towards the close of 1927.

Geological conditions are broadly similar to those of other parts of the Precambrian complex in which gold is found.

BRITISH COLUMBIA

British Columbia, holding second place among the gold-producing provinces, contributed in 1927 about 10 per cent of the Dominion total for this metal, but most of the yield is obtained from the smelting of ores in which other metals predominate. In the early days, placer production from the Cassiar and Cariboo districts was of greater importance than it has been in recent years. From 1858 to 1892 yields from the placer deposits of British Columbia made up the entire production of gold from the province; in 1895 the recovery from gold lode deposits was greater than from the placers. In 1927 placer gold production represented only 4 per cent of the total; gold in bullion from free milling ores made up 9 per cent; gold obtained in blister copper constituted 16 per cent; and gold in similar ores exported for treatment made up the balance or 71 per cent.

In lode mining the Portland Canal division furnishes a large production of gold. In 1927 it yielded more than 68.5 per cent of the gold output of the province. This district includes the Premier mine. Osoyoos, Skeena, Vancouver, Nass River, Atlin, Trail Creek and Nelson divisions follow in importance. The deposits of Portland Canal, Vancouver, Trail, Skeena and Nass are complex ores, which are important for their content of silver or base metals as well as for gold.

The gold lodes of British Columbia are either in or associated with igneous rock, especially where these invade rocks of earlier age. Such conditions obtain over vast areas along the border of the Coast range and also in other parts of the province. Since the main geological features are on a large scale and the province is but sparsely inhabited, it follows that many such zones of contact that are favourable for the occurrence of minerals of value, are still little known in detail over great distances. Consequently the province offers a field for prospecting that is of great magnitude and promise and increased production may be looked for with confidence.

YUKON

Still holding third place among Canada's gold-producing geographical divisions, Yukon Territory produced 30,935 ounces of fine gold in 1927, nearly all of which was from alluvial deposits. Following the discovery of placer gold in the Yukon in 1896, there was a great rush to this new field and the placer gold output from the Territory increased enormously in the next few years, reaching a maximum in 1900 when the yield totalled more than a million ounces of fine gold. For a few years, production continued on a large scale but by 1908 the annual output had dropped to about 174,000 fine ounces. Lode mining was undertaken in a small way about 1910, but production from this source never reached very great proportions. During the years 1909 to 1913 there was once more a steady upward trend, due to increased placer workings. In the following year a recession set in, and the output has shown a continual shrinkage year by year, from 1914 until 1925, when there was again a slight upward turn to production; the output amounted to 47,817 fine ounces in 1925 as compared with a total of 34,825 fine ounces for 1924, but in 1927 it receded again to 30,935 ounces. There were 3 companies and approximately 53 individual operators working alluvial gold deposits in the Yukon in 1927. Work was done on 67 miles of ditches and the quantity of material handled was estimated at 2,421,489 cubic yards. In crude placer gold, about 80 per cent of the weight is fine gold, 18 per cent silver, and 2 per cent, base metal or material of no value.

(3) The Alluvial Gold Mining Industry

It is very difficult to secure complete information on alluvial mining in Canada since placer fields are mostly remote and except in a few cases are operated by small numbers of men of no fixed abode. Dredging and hydraulicking companies operating in the Yukon Territory send annual returns to the Bureau and with the aid of the *Mining Lands Branch*, Department of Interior, under whose regulations mining is carried on in this territory, more definite information is obtainable. The report of the Gold Commissioner, Dawson, Yukon Territory, regarding mining for the year ending March 31, 1928, is as follows:—

REPORT OF THE GOLD COMMISSIONER, DAWSON, YUKON TERRITORY, REGARDING MINING

Placer Gold Mining.—The amount of placer gold mined during the year on which royalty export tax was paid was 37,478.68 ounces, which is an increase over the previous year, export tax having been paid on 33,166.94 ounces in 1926-27.

Burrall and Baird, Limited.—This company operated dredge *Canadian No. 2* on Hydraulic Mining Lease No. 18, below Bear creek. This dredge commenced digging on June 15, and closed down on December 5, having dredged 1,143, 703 cubic yards of virgin ground. In all some one million cubic yards of ground were thawed by cold water process, the water for which was pumped from the Klondike river, and distributed by means of four electrically-driven pumps. The constant use of three Keystone drills was required throughout the season and one hundred and seventy-nine holes, totalling 4,784 lineal feet, were sunk.

Dredge *Canadian No. 4*, similar to *Canadian No. 2*, sunk in the spring of 1924, was raised by May 1st last year, and was repaired, equipped and in operation by November 14. It is in a position to resume operations this year.

Dredge *Canadian No. 3* has not been operated since the commencement of the war and was dismantled to keep the other two dredges of identical build supplied with necessary repair parts. New machinery has been ordered, and it is intended that this dredge will be placed in a position to commence operations the coming season in the Klondike valley opposite Jackson Gulch.

Included in the new equipment added in 1927 were three caterpillars which were used in hauling supplies and materials to the different fields of operations.

The Twelvemile Ditch which conveys water from the Twelvemile river to serve the hydraulic operations on the hillsides above the Klondike river and on Bonanza creek, was placed in a state of efficient repair. The first water reached the hydraulic mines on Lovett and Jackson Gulches the early part of August. A large number of men and a number of teams of horses were employed on it during the season.

A saw mill with a capacity of 10,000 feet per day was erected at Bear creek, and the board roadbed of the Syphon bridge, crossing the Klondike river at that place, was re-decked.

The average number of men employed during a period of seven months was eighty-two, in addition to an average of thirty-six men employed for six months on the Twelvemile ditch and hydraulics.

Export tax amounting to \$3,577.72 was paid on gold recovered by the dredges, and \$415.10 from hydraulic operations.

The New North West Corporation, Limited.—Extensive operations were carried on during the season by this company and its subsidiaries, the Dominion Mining Company, Limited, The Big Creek Mining Company, Limited, and The Calder Mining Company, Limited.

The hydro-electric plant at North Fork was operated continuously throughout the year and generated a total of 8,019,500 k.w.h. Power was furnished to Burrall and Baird, Limited, to operate their dredges and other enterprises; to the Dominion Mining Company, Limited, The Big Creek Mining Company, Limited; also to The Dawson Electric Light and Power Company, Limited, for lighting the city of Dawson; and to The Dawson City Water and Power Company, Limited, to pump and heat the water furnished the city. The sixty miles of transmission lines connecting the power plant with the several sub-stations were maintained in an efficient state of repair.

A new high tension transmission line was constructed from Granville to Quartz creek, a distance of twenty miles, and a sub-station erected at Quartz creek.

Dredge *New North West No. 1* commenced digging on June 1, on Creek Claim No. 5 above Lower Discovery, on Dominion creek, and closed down on November 7, on Creek Claim No. 7-A. 582,771 cubic yards of gravel and bedrock were dug. More than half of this was frozen ground and had to be thawed by artificial means. A thawing plant of 1,600 points was operated by two electrically driven pumps, which supplied 6,000 gallons of water a minute under the pressure of approximately thirty pounds at the points.

Dredge *New North West No. 2*, of a type and capacity similar to *New North West No. 1*, commenced digging on May 16, on Creek Claim No. 240 below Lower Discovery, on Dominion creek, and closed down on November 7, having dug 636,615 cubic yards of gravel and bedrock, all of which was frozen. A thawing plant of 1,000 points was operated and for the greater portion of the season the water was furnished entirely through ditches constructed under authority of Water Grants Nos. 9024 and 9025. This was supplemented at times by the output from an electrically operated pump supplying 3,000 gallons a minute. The ditches were continually patrolled and maintained in a state of good repair. An area of 71,878 square yards was thawed in 1927.

A model 37 Marion electric shovel was assembled and erected on Creek Claim No. 255 below Lower Discovery, on Dominion Creek, and is ready to commence operations during the present summer.

A revolving Thew steam shovel was erected on No. 38 Gold Run creek to be used in opencut mining in connection with a cable way, which it is proposed to instal in the coming summer.

Operations on Quartz creek for the Calder Mining Company, Limited, a subsidiary of the New North West Corporation, Limited, consisted of the setting up of a Marion electric shovel No. 37 on Creek Claim No. 35 below A. Mack's discovery. The work was completed and the shovel started to dig in the month of October.

An average of one hundred men was employed for a period of seven months.

Export tax on gold was paid to the amonut of \$7,786.69.

Assessment work on 1,111 mining claims owned or controlled by this company, its subsidiaries and associates, was sworn in and renewal fees paid to the Mining Recorder.

Other Placer Operations.—In addition to what may be termed the large scale operations referred to above, many individuals and miners working in partnership were engaged in placer mining throughout the various parts of the Territory, and on the whole had a successful season.

Lode Mining.—Dawson District.—Development work has been continued on the Lone Star group of claims on Victoria gulch, but no ore was shipped during the year. An attempt is being made to obtain additional capital to prosecute development vigorously during the coming year.

A number of claims have been kept in good standing at the mouth of Fifteenmile on the Yukon river, and a few tons of ore have been taken out for shipment.

No development has been done on the Indian river conglomerate, but a large number of claims are still being held with the hope of obtaining capital for development.

During the year a small group of claims has been staked on Eldorado Creek and some development is being done, but no report of the results has yet been received.

Claims on Little Twelvemile River and on Gold Run are still being held but only representation work has been done.

Mayo District.—The principal producer in this district still continues to be Keno Hill, although a considerable quantity of ore has been shipped from Galena and Sourdough Hills. The principal operator is the Treadwell Yukon Company, Limited. This company mined some 35,000 tons of ore. The mill operated 93 per cent of the total time and treated 44,687 tons of ore of which 25,284 tons were for their own company, 2,531 tons for the Keno Hill, Limited, and 16,872 tons from the Sadie claim under lease agreement. The company's mill in addition to treating its own ore, has also treated a large quantity for individual miners in the vicinity, which has been of great service to the smaller operators.

Shipments of ore have been continued from the Settlemier and Bermingham property on Galena Hill. A considerable amount of development work has been done on other properties in this vicinity. Small shipments have been made from Gordon and Johnson properties on Sourdough Hill.

In the Beaver river district prospecting and development has been carried on quite extensively, both by individual miners and by the Consolidated Mining Company of Canada, Limited. Many promising leads of ore have been uncovered and the district is rapidly progressing beyond the development state.

In the southern end of the Territory mining has been very active during the past twelve months, and the outlook is brighter than it has been for several years. In fact the future of the Yukon Territory as to lode mining never looked as promising as it does to-day. The Beaver country with its big lead deposits is rapidly coming to the front, the copper mines in the Whitehorse district will shortly be in the producing stage again, the Wheaton River is going ahead with outside capital, the silver-lead deposits below Dawson have possibilities, and high grade galena has also been located on Rude Creek although considerable development work will have to be done yet to determine the extent of the deposits.

The territorial assayer at Keno has been kept busy during the year. 1,672 samples were received from various parts of the Territory, and 2,607 assays or quantitative analyses were made.

The advent of aeroplane service to different parts of the Territory will undoubtedly be an inducement to those outside mining engineers who wish to come in, but could not afford to spend the time usually taken to get into the country.

Coal.—The Five Fingers Coal Company operated their mine at Tantalus Butte during the year and shipped a considerable tonnage to Dawson.

In 1926 arrangements were made with the *Department of Mines* of British Columbia whereby the annual mining returns were collected by the province and forwarded to the *Bureau of Statistics*. This method enabled the Bureau to get reports from a larger number of small operators than was previously possible, more particularly with regard to alluvial gold.

Nearly all the alluvial gold recovered in 1927 in British Columbia was obtained from the Atlin and Cariboo divisions. In Atlin production was normal but there was a marked decrease in the Cariboo output. The Kafue Copper Development Company's dredge produced practically no placer gold during the year as it was engaged in digging its way from Antler creek to a new area on Cunningham Pass creek. Although production was less in 1927, much exploratory work was carried on, and it is hoped this will result in larger outputs in the future.

Records show that in 1927 there were 94 concerns, including individual operators, engaged in winning gold from the placers of the Yukon Territory and British Columbia. Salaried employees and wage-earners to the number of 321 people received \$339,841 for their services. Gold recoveries amounted to 47,264 crude ounces, valued at \$793,073. Of this amount, 38,073 crude ounces were produced in the Yukon and 9,191 crude ounces, in British Columbia. In addition, 21 ounces of platinum valued at \$960 were recovered in placer operations on the Tulameen river. The quantity of material handled amounted to 4,892,041 cubic yards, of which 2,470,552 yards were handled in the Yukon and 2,421,489 in British Columbia. The length of ditches in operation was 104 miles.

Table 108.—Principal Statistics of the Alluvial Gold Mining Industry in Canada, 1926 and 1927

Item	Yukon		British Columbia		Canada	
	1926	1927	1926	1927	1926	1927
Number of firms and individual operators*..	80	56	28	38	108	94
Time in operation—months.....	6-8	6-8	6-8	6-8	6-8	6-8
Capital employed..... \$	4,189,591	8,524,064	513,211	1,129,059	4,702,808	9,653,723
Number of employees.....	187	154	98	167	285	321
Wages paid..... \$	235,117	310,979	104,724	161,617	339,841	472,596
Fuel and electricity used..... \$	44,085	22,018	397	8,816	44,482	30,834
Electricity generated—						
(a) for own use..... k.w.h.		2,014,730				2,014,730
(b) for sale..... k.w.h.		3,814,720				3,814,720
Value of electricity sold..... \$		58,294				58,294
Crude gold recovered..... crude oz.	31,680	38,073	20,912	9,191	52,592	47,264
Value of gold and silver..... \$	527,451	640,141	348,177	152,932	875,625	793,073
Platinum recovered..... crude oz.			50	21	50	21
Value of platinum recovered..... \$			4,258	960	4,258	960
Quantity of material handled..... cubic yd.	2,501,200	2,421,489	1,237,090	2,470,552	3,738,290	4,892,041
Length of ditches..... miles	120	67	37	37	157	104
Total value of alluvial gold production..... \$	527,451	640,141	352,435	153,892	879,886	794,033

*In addition to the number shown in the table there were many individual operators from whom no returns were available.

(4) The Auriferous Quartz Mining Industry

In 1927 there were 76 auriferous quartz mines operating in Canada and of these 37 produced bullion or shipped ores while 39 carried development work only. There were 13 mines operating in Nova Scotia, 46 in Ontario, 1 in Manitoba and 16 in British Columbia. The corresponding data for 1926 were: Nova Scotia, 7; Ontario, 38; Manitoba, 3; and British Columbia, 12.

Ore mined totalled 4,605,190 tons of which 4,514,389 tons were milled and 4,310,369 tons were cyanided. Tailings re-treated amounted to 53,155 tons. Gold bullion recovered by amalgamation amounted to 158,160 crude ounces and by cyanidation, 2,036,676 crude ounces. Shipments of bullion having a total value of \$33,997,427 amounted to 2,193,569 crude ounces containing 1,638,149 fine ounces of gold and 269,535 fine ounces of silver. Ores, concentrates and high grade slags shipped to the smelters totalled 126,432 tons having a net value (value less freight and treatment charges) of \$3,455,568; these shipments contained 125,588 fine ounces of gold, 3,301,421 fine ounces of silver, 289,382 pounds of copper, and 1,266,790 pounds of arsenic.

Capital employed in this industry in Canada in 1927 amounted to \$118,381,468 as against \$103,945,022 in the previous year. Payments of \$12,935,719 in salaries and wages were made to 8,022 employees. Of these, 487 were on salary, 2,098 were wage-earners working on the surface, 4,668 worked underground and 769 were employed in the concentrators. Of the total number employed, 262 worked in Nova Scotia gold mines, 7,051 in Ontario, 85 in Manitoba, and 624 in British Columbia.

Increased milling capacities, improved mechanical equipment and greater metallurgical knowledge all combined to make 1927 the record year to date of gold production in Canada.

Table 109.—Principal Statistics of the Auriferous Quartz Mining Industry in Canada, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates or residues shipped from the mines
			\$		\$	\$	\$
1923.....	65	65	77,574,976	5,524	8,961,434	1,497,197	25,021,837
1924.....	70	70	83,982,765	6,738	10,500,140	1,559,406	31,298,107
1925.....	52	52	84,904,062	7,052	11,931,948	1,836,050	35,035,361
1926.....	60	60	103,945,022	7,663	12,340,623	2,083,811	35,171,561
1927.....	72	76	118,381,468	8,022	12,935,719	2,222,085	37,452,995

Table 110.—Capital Employed by Provinces in the Auriferous Quartz Mining Industry in Canada, 1926 and 1927

—	*Nova Scotia		Ontario		Manitoba		British Columbia		Canada	
	No.	\$	No.	\$	No.	\$	No.	\$	No.	\$
1926										
Producing.....	3	45,000	18	71,366,445	.....	.....	9	10,335,757	30	81,747,202
Operating but not producing.....	4	662,594	20	17,597,118	3	3,703,797	3	*234,311	30	22,197,820
Total.....	7	707,594	38	88,963,563	3	3,703,797	12	10,570,068	60	103,945,022
1927										
Producing.....	8	8,261,017	19	75,219,335	.....	.....	10	13,197,962	37	96,678,314
Operating but not producing.....	6	1,988,519	27	19,118,622	.....	.....	6	596,013	39	21,703,154
Total.....	14	10,249,536	46	94,337,957	.....	.....	16	13,793,975	76	118,381,468

*Includes data for 1 producing mine in Manitoba in 1927.

Table 111.—Ores Mined and Milled, Crude Bullion Produced and Shipped from the Auriferous Quartz Mines in Canada, by Provinces, 1926 and 1927

	*Nova Scotia	Ontario	British Columbia	Canada
1926				
Number of producing mines.....	3	18	9	30
Ore mined..... tons	9,662	3,700,261	321,112	4,031,035
Ore milled..... tons	9,612	3,686,597	191,832	3,888,041
Bullion recovered by amalgamation..... crude oz.	214	147,741	17,165	165,120
Ores cyanided..... tons		3,657,078	48,900	3,705,978
Bullion recovered by cyanidation..... crude oz.		1,753,477	39,995	1,793,472
Bullion shipped..... crude oz.	1,625	1,902,442	57,209	1,961,276
Contents of bullion shipped—Gold..... fine oz.	1,529	1,490,964	25,265	1,517,758
Silver..... fine oz.	77	248,352	17,164	265,593
Value..... \$	31,638	30,971,183	525,052	31,527,873
Net value of ores, slags and residues sold..... \$		73,115	3,571,218	3,644,333
Exchange premium..... \$		645		645
Total net receipts..... \$	31,638	31,043,653	4,096,270	35,171,561
1927				
Number of producing mines.....	8	19	10	37
Ore mined..... tons	6,191	4,291,041	307,958	4,605,190
Ore milled..... tons	12,161	4,291,041	211,187	4,514,389
Tailings re-treated..... tons	10,000	5	43,150	53,155
Bullion recovered by amalgamation..... crude oz.	2,395	146,881	8,884	158,160
Ores cyanided..... tons	5,771	4,261,448	43,150	4,310,369
Bullion recovered by cyanidation..... crude oz.	310	2,021,985	14,381	2,036,676
Bullion shipped..... crude oz.	2,705	2,167,293	23,571	2,193,569
Content of bullion shipped—Gold..... fine oz.	2,383	1,619,147	16,619	1,638,149
Silver..... fine oz.	137	266,946	2,452	269,535
Value..... \$	49,330	33,621,783	326,314	33,997,427
Net value of ores, slags and residues sold..... \$	20,700	94,852	3,340,016	3,455,568
Total net receipts..... \$	70,030	33,716,635	3,666,330	37,452,995

*Includes data for 1 mine in Manitoba in 1927.

Table 112.—Ores, Concentrates and Slags Shipped from the Auriferous Quartz Mines in Canada, 1926 and 1927

Item	British Columbia mines shipping		Canada*
	To Canadian smelters	To Foreign smelters	
1926			
Number of mines.....	3	7	9
Tons of ore, etc., shipped.....	52,419	97,225	150,522
Metal content—			
Gold..... oz.	29,890	103,573	135,193
Silver..... oz.	715,508	2,490,093	3,206,520
Copper..... lb.			360,093
Lead..... lb.	690,967	528,033	1,219,000
Zinc..... lb.	1,201,134	41,250	1,242,384
Arsenic..... lb.		1,019,200	1,019,200
Net value..... \$	766,961	2,804,257	3,644,333
1927			
Number of mines.....	4	4	14
Tons of ore, etc., shipped.....	18,327	106,281	126,432
Metal content—			
Gold..... oz.	11,565	109,957	125,588
Silver..... oz.	451,001	2,845,315	3,301,421
Copper..... lb.			289,382
Lead..... lb.	165		165
Zinc..... lb.	20		20
Arsenic..... lb.		1,231,790	1,266,790
Net value..... \$	374,390	2,965,626	3,455,568

*Includes data for 2 mines in Ontario in 1926 and for 5 mines in Ontario and 1 in Nova Scotia in 1927.

Table 113.—Employees, Salaries and Wages in the Auriferous Quartz Mining Industry in Canada by Provinces, 1926 and 1927

Province	1926						1927					
	Number of employees					Salaries and wages	Number of employees					Salaries and wages
	On sal- ary	Wage-earners			Total em- ployees		On sal- ary	Wage-earners			Total em- ployees	
		Sur- face	Under- ground	Mill				Sur- face	Under- ground	Mill		
						\$						\$
Nova Scotia.....	6	71	68	6	151	107,971	14	128	77	43	262	187,198
Ontario.....	403	1,649	4,032	593	6,677	10,740,890	421	1,725	4,250	655	7,051	11,525,467
Manitoba.....	9	54	40	.....	103	171,795	8	35	24	18	85	164,041
British Columbia.....	86	239	313	94	732	1,319,967	44	210	317	53	624	1,059,013
Canada.....	504	2,013	4,453	693	7,663	12,340,623	487	2,098	4,668	769	8,022	12,935,719

Table 114.—Wage-Earners in the Auriferous Quartz Mining Industry in Canada by Months, 1926 and 1927

Month	1926				1927			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	1,727	4,364	577	6,668	1,942	4,369	699	7,010
February.....	1,749	4,340	599	6,688	1,925	4,414	716	7,055
March.....	1,857	4,329	615	6,801	1,843	4,437	740	7,020
April.....	1,791	4,403	630	6,824	1,866	4,591	751	7,208
May.....	1,857	4,307	641	6,805	1,904	4,560	718	7,182
June.....	1,921	4,314	666	6,901	2,001	4,563	743	7,307
July.....	1,868	4,273	682	6,823	2,023	4,516	736	7,275
August.....	1,969	4,296	687	6,952	2,116	4,519	726	7,361
September.....	2,020	4,269	694	6,983	2,209	4,592	718	7,519
October.....	2,111	4,376	673	7,160	2,172	4,693	709	7,574
November.....	2,036	4,402	668	7,106	2,209	4,729	689	7,627
December.....	1,981	4,358	646	6,985	2,000	4,620	682	7,302

Table 115.—Fuel and Electricity Used in the Auriferous Quartz Mining Industry in Canada 1926 and 1927

Kind	Unit measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	28,193	293,298	3,147	26,134
(b) Imported.....	Ton			23,380	231,305
Anthracite coal.....	Ton	990	19,997	660	11,704
Lignite coal (a) Canadian.....	Ton				
(b) Imported.....	Ton			61	868
Coke.....	Ton	459	8,973	322	5,161
Gasoline.....	Imp. gal.	62,341	25,455	44,595	17,111
Kerosene.....	Imp. gal.			28,931	7,008
Fuel oil and diesel oil.....	Imp. gal.	1,369,836	120,069	1,395,938	121,230
Wood.....	Cord	15,747	67,910	13,445	58,249
Gas (a) manufactured.....	M cu. ft.			6,902	329
(b) Natural.....	M cu. ft.				
Other fuel.....			957		126
Electricity purchased*.....	K.W.H.	169,287,220	1,547,152	221,866,174	1,742,860
Total.....			2,083,811		2,222,085
Electricity generated*—					
(a) For own use.....	K.W.H.			9,575,633	
(b) For sale.....	K.W.H.				

* In 1926, the record shows only total electricity used.

Table 116.—Power Employed in the Auriferous Quartz Mining Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	18	1,165	18	1,077
Gasoline, gas and oil engines.....	48	5,645	41	6,011
Hydraulic turbines or water wheels.....	12	4,411	21	6,753
<i>Total primary power.....</i>	<i>78</i>	<i>11,221</i>	<i>80</i>	<i>13,841</i>
Electric motors run by purchased power.....	889	47,036	1,107	57,601
Total power employed.....	967	58,257	1,187	71,442
Electric motors run by primary power in same plant.....	110	4,741	115	5,132
<i>Total electric motors.....</i>	<i>999</i>	<i>51,777</i>	<i>1,222</i>	<i>62,733</i>
Boilers.....	62	4,636	82	7,22

5. The Copper-Gold-Silver Mining Industry

Canada.—The copper-gold-silver mining industry comprises a group of mines producing ore containing copper, gold and silver in which copper values predominate. Most of the producing mines in this class are in British Columbia; Manitoba is known to have big ore reserves of copper and much development work was done in this province in 1927; Ontario properties of this class are still in the prospect stage. In Quebec, the Eustis property produced copper concentrates for export and the Horne mine, after a season of heavy development of the mine and speedy construction of the smelter, began producing about the middle of December. Prospecting and development work was carried on at several other properties in northwestern Quebec, with a view to shipping to the Noranda smelter. The principal mines operating in 1927 were: British Columbia—the Hidden Creek mine which shipped to the Granby Consolidated Mining, Smelting and Power Co., Ltd.; the Britannia mine which exported concentrates to the smelter at Tacoma, Wash.; and the Allenby Copper Company near Princeton, which shipped to the Consolidated Mining and Smelting Company, Ltd., at Trail: Quebec—the Horne mine of the Horne Copper Corporation shipped to the Noranda smelter owned by the same corporation, and the Consolidated Copper and Sulphur Co., Ltd., formerly the Eustis mine, exported concentrates to the United States for treatment.

Because of interplant relations, companies which mine and smelt their own ore sometimes have difficulty in making a separation of the capital employed at the mine and the smelter. The value placed on their own ore at the mine may be nominal and any profit accruing from the operations would appear to be credited to the smelter. For that reason the net value placed on shipments to the smelter may not be the same as a value computed from the metal content as determined by settlement assay.

With these limitations the capital employed in the copper-gold-silver mining industry in Canada in 1927 amounted to \$24,232,169. Salaries and wages paid in the industry amounted to \$5,260,095 and employees numbered 4,083 persons. Fuel used and electricity purchased amounted to \$596,137, the principal item being \$424,930 for the electricity. Primary power equipment employed, numbered 432 units with a total rating of 34,234 h.p., comprising 392 motors operating on purchased power, 12 hydraulic turbines or water wheels, 23 gasoline and oil engines and 5 steam engines. Motors operated by power generated at the mines numbered 44 with a total rating of 450 h.p. The boilers numbered 40 and were rated at 2,427 h.p.

During the year 3,636,759 tons of ore were raised, 3,243,630 tons were milled and 210,029 tons of copper concentrates were produced. Shipments to Canadian smelters consisted of 337,170 tons of copper ore, 83,422 tons of copper concentrates and 16,900 tons of iron pyrites; to United States smelters, 59 tons of ore, 126,006 tons of concentrates and 33,500 tons of iron pyrites.

These shipments totalled to 597,057 tons valued at \$9,822,881 and contained 26,944 fine ounces of gold, 655,998 fine ounces of silver, 95,781,175 pounds of copper and 24,913 tons of sulphur.

Table 117.—Principal Statistics of the Copper-Gold-Silver Mining Industry in Canada, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of ores, concentrates, etc., shipped by mines
			\$		\$	\$	\$
1923.....	14	14	19,108,072	1,790	3,004,292	334,696	4,361,486
1924.....	15	15	19,099,845	2,118	3,292,228	366,153	5,226,859
1925.....	40	41	23,200,580	2,374	3,555,844	413,767	7,758,990
1926.....	76	84	27,936,685	3,403	4,546,493	541,914	9,973,049
1927.....	118	125	24,232,169	4,083	5,260,095	596,137	9,822,881

NOTE.—The large increase in number of mines in 1927 without the corresponding increase in capital employed is due to the increase in development operations carried on in the province of Quebec.

Table 118.—Capital Employed in the Copper-Gold-Silver Mining Industry in Canada, 1926 and 1927

	Quebec				Manitoba			
	1926		1927		1926		1927	
	No.	\$	No.	\$	No.	\$	No.	\$
Producing.....	2		3					
Operating but not producing.....	61		88				3	
Total.....	63	18,420,068	91	12,673,426			3	524,014

	British Columbia				Canada			
	1926		1927		1926		1927	
	No.	\$	No.	\$	No.	\$	No.	\$
Producing.....	18		14		20	11,078,469	17	9,432,013
Operating but not producing.....	3		17		64	16,858,225	108	14,800,156
Total.....	21	9,516,617	31	11,034,729	84	27,936,685	125	24,232,169

Table 119.—Shipments from Copper-Gold-Silver Mines of Canada, 1926 and 1927

Destination	Quantity	Net value	Content as determined by settlement assay			
			Go'd.	Silver	Copper	Sulphur
	Tons	\$	Fine oz.	Fine oz.	Pounds	Tons
1926						
11 mines shipped to Canadian smelters—						
Ores.....	664,746	2,405,568	14,567	364,564	28,401,619	
Concentrates.....	51,267	2,378,198	4,406	172,496	23,546,484	
6 mines shipped to foreign smelters—						
Ores.....	5	671		142	6,377	
*Concentrates.....	133,519	5,188,612	21,590	223,261	44,797,857	7,343
Total.....	849,937	9,973,049	40,563	760,463	96,752,337	7,343
1927						
12 mines shipped to Canadian smelters—						
Ores.....	337,170	1,681,808	10,504	189,326	14,002,517	
Copper concentrates.....	83,422	3,219,267	5,220	225,449	34,235,296	
Pyrite concentrates.....	16,900	57,470				8,262
7 mines shipped to foreign smelters—						
Ores.....	59	1,482	31	1,103	9,017	
Copper concentrates.....	126,006	4,728,012	11,189	240,120	47,534,345	
Pyrite concentrates.....	33,500	134,842				16,651
Total.....	597,057	9,822,881	26,944	655,998	95,781,175	24,913

*Includes 14,100 tons of pyrites concentrates.

Table 120.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, 1926 and 1927

	1926			1927		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
SALARIED EMPLOYEES—						
Total.....	244	15	530,079	325	15	612,303
WAGE-EARNERS—						
Surface.....	1,725	19	4,016,414	2,097	20	4,647,792
Underground.....	1,400			1,626		
Total.....	3,125	19	4,016,414	3,723	20	4,647,792
Total.....	3,369	34	4,546,493	4,048	35	5,260,095

Table 121.—Wage-Earners in the Copper-Gold-Silver Mining Industry in Canada by Months, 1926 and 1927

Month	1926				1927			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	756	1,363	295	2,414	903	1,356	309	2,568
February.....	808	1,306	294	2,408	882	1,355	309	2,546
March.....	816	1,314	334	2,464	990	1,366	330	2,686
April.....	881	1,307	338	2,526	1,107	1,430	348	2,885
May.....	937	1,341	326	2,604	1,192	1,456	378	3,026
June.....	1,246	1,354	328	2,928	1,353	1,518	384	3,255
July.....	1,383	1,293	336	3,012	1,442	1,552	380	3,374
August.....	1,378	1,359	336	3,073	1,598	1,666	384	3,648
September.....	1,481	1,334	333	3,148	1,593	1,668	384	3,645
October.....	1,470	1,392	358	3,220	1,672	1,660	360	3,692
November.....	1,372	1,407	330	3,109	1,545	1,620	353	3,518
December.....	1,203	1,295	315	2,813	1,469	1,594	336	3,399

Table 122.—Fuel and Electricity Used in the Copper-Gold-Silver Mining Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	6,627	56,387	3,996	42,052
(b) Imported.....	Ton			10	90
Anthracite coal.....	Ton	115	1,840	75	1,200
Lignite coal (a) Canadian.....	Ton			3,650	23,206
(b) Imported.....	Ton				
Coke.....	Ton	100	1,100	80	1,321
Gasoline.....	Imp. gal.	26,949	9,586	68,179	26,093
Kerosene.....	Imp. gal.			3,769	1,491
Fuel oil and diesel oil.....	Imp. g.l.	369,444	21,927	191,627	19,273
Wood.....	Cord	11,857	58,335	11,486	56,481
Gas (a) Manufactured.....	M cu. ft.				
(b) Natural.....	M cu. ft.				
Other fuel.....			31		
Electricity purchased*.....	K.W.H.	72,724,546	392,708	59,889,657	424,930
Total.....			541,914		596,137
Electricity generated *(a) for own use.....	K.W.H.			27,631,082	
(b) for sale.....	K.W.H.				

*In 1926, the record shows only total electricity used.

Table 123.—Power Employed in the Copper-Gold-Silver Mining Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	9	1,455	5	1,780
Gasoline, gas and oil engines.....	10	345	23	690
Hydraulic turbines or water wheels.....	9	10,450	12	9,610
<i>Total primary power.....</i>	<i>28</i>	<i>12,250</i>	<i>40</i>	<i>12,080</i>
Electric motors run by purchased power.....	358	19,705	392	22,154
Total power employed.....	386	31,955	432	34,234
Electric motors run by primary power in same plant.....	85	3,326	44	450
<i>Total electric motors.....</i>	<i>443</i>	<i>23,031</i>	<i>436</i>	<i>22,604</i>
Boilers.....	32	2,266	40	2,427

6. Commodity Statistics, Including Table Showing Production, Imports, Exports and World Output of Gold

Canada's gold production in 1927 again established a new high record with a total of 1,852,785 fine ounces which valued at the standard rate of \$20·671834 per fine ounce was worth \$38,300,464 as against the 1926 production of 1,754,228 fine ounces worth \$36,263,110, according to a report just issued by the Mining, Metallurgical and Chemical Branch of the Dominion Bureau of Statistics at Ottawa.

Production from Nova Scotia mines at 3,151 fine ounces was nearly double that of 1926 owing to the increased activity in gold mining in that province and because of shipments to Australia of concentrates containing arsenic and gold.

The Quebec output of 8,331 fine ounces showed an increase of over 100 per cent, due to the increase in the production of the silver-lead-zinc ores which carry gold and to the production of gold with blister copper at the Noranda smelter during the last two weeks of December, 1927.

Ontario produced 1,627,050 fine ounces in 1927 as against 1,497,215 in 1926. The Porcupine area showed a slight increase over the previous year; Kirkland lake area produced 35 per cent more than in 1926; and the amount of gold recovered from the nickel-copper ores of the Sudbury district was greater also.

Manitoba's production of 182 fine ounces was about the same as in the previous year but greater activity in development and prospecting was much in evidence.

British Columbia's output at 183,094 fine ounces decreased 19 per cent from the production of 1926. Though production of alluvial gold was normal in the Atlin district, the output from the Cariboo district was considerably reduced because the Kafue Copper Development Company's dredge was not producing in 1927. Gold in gold bullion and blister copper was less but gold in ores exported was greater. A considerable part of the gold production comes as a by-product of copper and silver mining and is subject to yearly variations according to the grade of ore mined.

Yukon production amounted to 30,935 fine ounces consisting of 30,778 fine ounces of alluvial gold, and 157 fine ounces in ores exported.

Table 124.—Production of Gold in Canada by Provinces and by Sources, 1926 and 1927

Province	1926		1927	
	Fine ounces	Value	Fine ounces	Value
		\$		\$
NOVA SCOTIA— In gold bullion and in concentrates exported.....	1,678	34,687	3,151	65,137
QUEBEC— In blister copper and in ores exported.....	3,680	76,072	8,331	172,217
ONTARIO— Porcupine area—In gold bullion.....	1,145,479	23,679,152	1,153,034	23,835,327
In slags exported.....	94	1,943	1,086	22,450
Kirkland lake area—In gold bullion.....	345,462	7,141,333	406,113	9,635,411
In slags exported.....	1,509	31,194	1,895	39,173
Sudbury area—In matte and blister copper exported.....	4,447	91,928	4,866	100,589
Miscellaneous.....	224	4,630	56	1,158
Total.....	1,497,215	30,950,180	1,627,050	33,634,108
MANITOBA— In gold bullion.....	188	3,886	182	3,762
ALBERTA.....			42	868
BRITISH COLUMBIA— In alluvial gold.....	16,730	345,840	7,353	152,000
In gold bullion.....	25,312	523,246	16,620	343,566
In blister copper.....	58,659	1,212,589	30,141	623,070
In base bullion and in ores exported.....	125,165	2,587,390	128,980	2,666,253
Total.....	225,866	4,669,065	183,094	3,784,889
YUKON— In alluvial gold.....	25,344	523,907	30,778	636,238
In ores exported.....	257	5,313	157	3,245
Total.....	25,601	529,220	30,935	639,483
Total Canada.....	1,754,228	36,263,110	1,852,785	38,300,464

Table 125.—Production of Gold from Canadian Sources, 1858-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1858.....	34,104	705,000	1882.....	60,288	1,246,268	1906.....	556,415	11,502,120
1859.....	78,129	1,615,072	1883.....	53,853	1,113,246	1907.....	405,517	8,382,780
1860.....	107,806	2,228,543	1884.....	51,202	1,058,439	1908.....	476,112	9,842,105
1861.....	128,973	2,666,118	1885.....	55,575	1,148,829	1909.....	453,865	9,382,230
1862.....	135,391	2,798,774	1886.....	70,782	1,463,196	1910.....	493,707	10,205,835
1863.....	202,498	4,186,011	1887.....	57,460	1,187,804	1911.....	473,159	9,781,077
1864.....	199,605	4,126,199	1888.....	53,145	1,098,610	1912.....	611,885	12,648,794
1865.....	192,898	3,987,562	1889.....	62,653	1,295,159	1913.....	802,973	16,598,923
1866.....	152,555	3,153,597	1890.....	55,620	1,149,776	1914.....	773,178	15,983,007
1867.....	145,775	3,013,431	1891.....	45,018	930,614	1915.....	918,056	18,977,901
1868.....	134,169	2,773,527	1892.....	45,905	907,601	1916.....	930,492	19,234,976
1869.....	102,720	2,123,405	1893.....	47,243	976,603	1917.....	738,531	15,272,992
1870.....	83,415	1,724,348	1894.....	54,600	1,128,688	1918.....	699,681	14,463,689
1871.....	105,187	2,174,412	1895.....	100,798	2,083,674	1919.....	766,764	15,850,423
1872.....	90,283	1,866,321	1896.....	133,282	2,754,774	1920.....	765,007	15,814,098
1873.....	74,346	1,536,871	1897.....	291,557	6,027,016	1921.....	926,329	19,148,920
1874.....	97,856	2,022,862	1898.....	666,336	13,775,420	1922.....	1,263,364	26,116,050
1875.....	130,300	2,693,533	1899.....	1,028,529	21,261,584	1923.....	1,233,341	25,495,421
1876.....	97,729	2,020,233	1900.....	1,350,057	27,908,153	1924.....	1,525,382	31,532,443
1877.....	94,304	1,949,444	1901.....	1,167,216	24,128,503	1925.....	1,735,735	35,880,826
1878.....	74,420	1,538,394	1902.....	1,032,161	21,336,687	1926.....	1,754,228	36,263,110
1879.....	76,547	1,582,358	1903.....	911,550	18,843,590	1927.....	1,852,785	38,300,464
1880.....	63,121	1,304,824	1904.....	796,374	16,462,517			
1881.....	63,524	1,313,153	1905.....	684,951	14,159,195	Total.....	31,696,655	655,228,102

*Calculated from the value \$1=0.048375 ounces.

Refined Gold.—Two refineries produced fine gold in Canada in 1927, namely the Royal Mint, Ottawa, and the Consolidated Mining and Smelting Company of Canada, Limited, at Tadanac, near Trail, B.C. From all ores treated in 1927, the latter company produced 29,334 fine ounces.

This gold was recovered principally from the gold in copper ores, but some was also recovered from silver-lead and dry ores. Small quantities of imported ores were also treated by this company.

Gold refined at the Royal Mint at Ottawa from the gold produced in Ontario and British Columbia and from the alluvial gold obtained in the Yukon, amounted to 1,448,180 fine ounces, including a small amount recovered from scrap and crude gold from various sources. The total production in Canada of refined gold during 1927 was, therefore, 1,477,514 fine ounces.

Table 126.—Refined Gold Produced at Trail, B.C., 1904-1927*

Year	Fine Ounces	Year	Fine Ounces
1904.....	4,336	1916.....	23,608
1905.....	8,602	1917.....	49,661
1906.....	9,993	1918.....	61,212
1907.....	10,395	1919.....	47,283
1908.....	15,346	1920.....	42,636
1909.....	18,241		
1910.....	13,298	1921.....	56,297
		1922.....	18,940
1911.....	15,270	1923.....	11,113
1912.....	12,118	1924.....	23,412
1913.....	11,977	1925.....	18,441
1914.....	11,088		
1915.....	17,813	1926.....	49,607
		1927.....	29,334

*Includes some gold derived from imported ores and from occasional shipments from Ontario, Manitoba, Alberta, and the Yukon.

Table 127.—Receipts of Gold Bullion from Canadian Sources at the Royal Mint, Ottawa, Ont., 1908-1927

Year	From Canadian Sources		From Foreign Countries	
	Crude oz.	Value gold content	Crude oz.	Value gold content
		\$		\$
1908.....	219.19	3,823.03		
1909.....	5,741.43	94,864.81	38.25	673.98
1910.....	65,009.35	1,079,223.42		
1911.....	89,493.11	1,469,087.43	511.24	9,128.55
1912.....	104,825.29	1,676,371.78	742.79	12,451.33
1913.....	212,076.41	3,363,870.30	633.23	11,609.84
1914.....	29,762.24	471,042.90	4,750.19	98,062.84
1915.....	89,231.47	1,402,605.19	871,693.79	15,838,222.01
1916.....	49,195.39	780,074.19	6,687,758.41	121,513,083.93
1917.....	55,779.96	840,265.33	8,196,151.04	148,919,793.48
1918.....	302,785.96	4,982,743.81	3,728,224.05	67,739,887.68
1919.....	654,906.28	10,865,770.57	8,917.02	134,756.38
1920.....	724,083.34	11,530,413.82		
1921.....	1,054,277.01	16,914,211.58	53.00	826.87
1922.....	1,376,863.35	22,469,160.42	345.22	5,387.63
1923.....	779,466.92	12,682,163.78	295.53	4,955.16
1924.....	169,239.28	2,297,170.32	90.53	1,395.41
1925.....	167,375.64	2,489,532.52	192.35	2,900.59
1926.....	1,766,034.26	28,432,544.12	104.93	1,615.15
1927.....	1,869,208.25	29,929,047.51	496.75	7,488.31

Table 128.—Receipts at the Royal Mint, Ottawa, Ont., by Sources, 1926 and 1927

Source	1926			1927		
	Gross weight	Precious metal content		Gross weight	Precious metal content	
		Fine gold	Fine silver		Fine gold	Fine silver
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
Nova Scotia.....	1,814.84	1,677.709	112.46	2,395.40	2,201.468	125.13
New Brunswick.....						
Quebec.....	43.26	39.159	3.67			
Ontario.....	1,610,194.93	1,258,570.437	224,105.60	1,721,110.57	1,338,191.977	229,657.45
Manitoba.....	152.51	128.553	18.68	310.35	182.336	12.20
Saskatchewan.....	73.98	55.303	8.81			
Alberta.....	5.16	4.045	0.41	48.15	41.633	4.42
British Columbia.....				8.44	7.030	0.66
Dominion of Canada Assay Office, Vancouver.....	124,477.87	104,252.882	16,658.25	111,197.14	92,320.267	14,875.74
Yukon.....						
Jewellery and scrap, various sources.....	29,271.71	12,696.275	4,684.32	34,138.20	14,873.012	4,930.92
Foreign.....	104.93	78.133	18.09	496.75	362.247	107.05
Total.....	1,766,139.19	1,375,502.499	245,610.29	1,869,705.00	1,448,179.970	249,713.67

Table 129.—Crude Bullion Received at Dominion Government Assay Office, Vancouver, B.C., 1908-1927

Year	Weight before melting	Weight after melting	Net value	Year	Weight before melting	Weight after melting	Net value
	Ounces	Ounces	\$		Ounces	Ounces	\$
1908 (a).....	90,175.48	89,117.76	1,478,894.00	1918.....	241,762.77	238,245.07	4,099,595.80
1909.....	48,478.58	47,576.27	789,267.94	1919.....	209,026.14	205,947.57	3,547,524.93
1910.....	46,064.31	45,228.92	746,101.92	1920.....	150,869.17	147,718.25	2,499,174.41
1911.....	39,784.70	39,069.31	647,416.38	1921.....	163,070.56	160,803.48	2,834,499.61
1912.....	59,068.82	57,951.98	974,077.14	1922.....	129,891.63	125,758.41	2,105,989.64
1913 (b).....	111,479.94	109,920.49	1,448,625.37	1923.....	129,043.63	124,546.48	2,051,369.65
1914.....	166,148.83	163,523.61	2,029,251.31	1924.....	114,041.96	107,569.15	1,850,373.74
1915.....	183,924.49	179,751.68	2,736,302.31	1925.....	140,691.78	123,202.39	2,065,217.16
1916.....	180,292.83	175,393.10	2,828,239.65	1926.....	162,606.56	145,279.61	2,524,337.58
1917.....	191,626.04	187,884.48	3,257,220.71	1927.....	108,030.89	102,192.93	1,750,599.35

(a) For 9 months only. (b) The removal of the assay charge in January 1913, accounts for the large increase.

NOVA SCOTIA

Table 130.—Production of Gold from Nova Scotia Ores, 1862-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$
1862.....	6,863	141,871	1896.....	23,876	493,568
1863.....	13,180	272,448	1897.....	27,195	562,165
1864.....	18,883	390,349	1898.....	26,054	538,590
1865.....	24,011	496,357	1899.....	29,876	617,604
			1900.....	28,955	598,553
1866.....	23,776	491,491			
1867.....	25,763	532,563	1901.....	26,459	546,963
1868.....	19,377	400,555	1902.....	30,348	627,357
1869.....	16,855	348,427	1903.....	25,533	527,806
1870.....	18,740	387,392	1904.....	10,362	214,209
			1905.....	13,707	283,353
1871.....	18,139	374,972			
1872.....	12,352	255,349	1906.....	12,223	252,676
1873.....	11,180	231,122	1907.....	13,675	282,686
1874.....	8,623	178,244	1908.....	11,842	244,799
1875.....	10,576	218,629	1909.....	10,193	210,711
			1910.....	7,928	163,891
1876.....	11,300	233,585			
1877.....	15,925	329,205	1911.....	7,781	160,854
1878.....	11,864	245,253	1912.....	4,385	90,638
1879.....	12,980	268,328	1913.....	2,174	44,935
1880.....	12,472	257,823	1914.....	2,904	60,031
			1915.....	6,636	137,180
1881.....	10,147	209,755			
1882.....	13,307	275,090	1916.....	4,562	94,305
1883.....	14,571	301,207	1917.....	2,210	45,685
1884.....	15,168	313,554	1918.....	1,176	24,310
1885.....	20,945	432,971	1919.....	850	17,571
			1920.....	690	14,263
1886.....	22,038	455,564			
1887.....	20,009	413,631	1921.....	439	9,075
1888.....	21,137	436,939	1922.....	1,042	21,540
1889.....	24,673	510,029	1923.....	655	13,540
1890.....	22,978	474,990	1924.....	1,047	21,643
			1925.....	1,626	33,612
1891.....	21,841	451,503			
1892.....	18,865	389,965	1926.....	1,678	34,687
1893.....	18,436	381,095	1927.....	3,151	65,137
1894.....	18,534	389,338			
1895.....	21,919	453,119	Total.....	918,959	18,996,650

*Calculated from the value: one dollar=0.048375 ounces.

QUEBEC

Table 131.—Production of Gold from Quebec Ores, 1877-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1877.....	583	12,057	1895.....	62	1,281	1912.....	642	13,270
1878.....	868	17,937				1913.....	701	14,491
1879.....	1,160	23,972	1896.....	145	3,000	1914.....	1,292	26,708
1880.....	1,605	33,174	1897.....	44	900	1915.....	1,099	22,720
			1898.....	295	6,089			
1881.....	2,741	56,661	1899.....	238	4,916	1916.....	1,034	21,375
1882.....	827	17,093	1900.....			1917.....	1,511	31,235
1883.....	860	17,787				1918.....	1,939	40,083
1884.....	422	8,720	1901.....	145	3,000	1919.....	1,470	30,388
1885.....	103	2,120	1902.....	391	8,073	1920.....	955	19,742
			1903.....	180	3,712			
1886.....	193	3,981	1904.....	140	2,900	1921.....	635	13,127
1887.....	78	1,604	1905.....	191	3,940	1922.....		
1888.....	181	3,740				1923.....	667	13,788
1889.....	58	1,207	1906.....	165	3,412	1924.....	883	18,253
1890.....	65	1,350	1907.....			1925.....	1,602	33,116
			1908.....					
1891.....	87	1,800	1909.....	193	3,990	1926.....	3,680	76,072
1892.....	628	12,987	1910.....	124	2,565	1927.....	8,331	172,217
1893.....	759	15,696						
1894.....	1,412	29,196	1911.....	613	12,672	Total.....	41,997	868,117

*Calculated from the value: one dollar=0.048375 ounces.

ONTARIO

Table 132.—Production of Gold from Ontario Ores, 1887-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1887.....	327	6,760	1901.....	11,844	244,837	1915.....	406,577	8,404,693
1888.....			1902.....	11,118	229,828			
1889.....			1903.....	9,096	188,036	1916.....	492,481	10,180,485
1890.....			1904.....	1,935	40,000	1917.....	423,261	8,749,581
			1905.....	4,402	91,000	1918.....	411,976	8,516,299
1891.....	97	2,000				1919.....	505,739	10,454,553
1892.....	344	7,118	1906.....	3,202	66,193	1920.....	564,995	11,679,483
1893.....	708	14,637	1907.....	3,212	66,398			
1894.....	1,917	39,624	1908.....	3,212	66,398	1921.....	708,213	14,640,062
1895.....	3,015	62,320	1909.....	1,569	32,425	1922.....	1,000,340	20,678,862
			1910.....	3,089	63,849	1923.....	971,704	20,086,904
1896.....	5,563	115,000				1924.....	1,241,728	25,668,795
1897.....	9,157	189,294	1911.....	2,062	42,625	1925.....	1,461,039	30,202,357
1898.....	12,863	265,889	1912.....	86,523	1,788,596			
1899.....	20,394	421,591	1913.....	219,801	4,543,690	1926.....	1,497,215	30,950,180
1900.....	14,391	297,495	1914.....	268,264	5,545,509	1927.....	1,627,050	33,634,108
						Total.....	12,010,423	248,277,474

*Calculated from the value: one dollar=0.048375 ounces.

MANITOBA

Table 133.—Production of Gold from Manitoba Ores 1917-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$
1917.....	440	9,095	1923.....	31	641
1918.....	1,926	39,814	1924.....	1,180	24,393
1919.....	724	14,966	1925.....	4,424	91,452
1920.....	781	16,145			
1921.....	207	4,279	1926.....	188	3,886
1922.....	156	3,225	1927.....	182	3,762
			Total.....	10,239	211,658

*Calculated from the value: one dollar=0.048375 ounces.

ALBERTA

Table 134.—Production of Gold from Alberta, 1887-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1887.....	102	2,100	1902.....	484	10,000	1917.....		
1888.....	58	1,200	1903.....	48	1,000	1918.....	27	558
1889.....	967	20,000	1904.....	24	500	1919.....	24	500
1890.....	193	4,000	1905.....	121	2,500	1920.....		
1891.....	266	5,500	1906.....	39	800	1921.....	49	1,012
1892.....	508	10,506	1907.....	33	675	1922.....		
1893.....	466	9,640	1908.....	50	1,037	1923.....		
1894.....	726	15,000	1909.....	25	525	1924.....		
1895.....	2,419	50,000	1910.....	89	1,850	1925.....		
1896.....	2,661	55,000	1911.....	10	207	1926.....		
1897.....	2,419	50,000	1912.....	73	1,509	1927.....	42	868
1898.....	1,209	25,000	1913.....					
1899.....	726	15,000	1914.....	48	992			
1900.....	242	5,000	1915.....	195	4,026			
1901.....	726	15,000	1916.....	82	1,695			
						Total.....	15,151	313,201

*Calculated from the value: one dollar = 0.048375 ounces.

BRITISH COLUMBIA

Table 135.—Production of Gold from British Columbia Ores, 1858-1927

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1858.....	34,104	705,000	1882.....	46,154	954,085	1906.....	269,886	5,579,039
1859.....	78,129	1,615,072	1883.....	38,422	794,252	1907.....	236,216	4,883,020
1860.....	107,806	2,228,543	1884.....	35,612	736,165	1908.....	286,858	5,929,880
			1885.....	34,527	713,738	1909.....	250,320	5,174,579
1861.....	128,973	2,666,118				1910.....	261,386	5,403,318
1862.....	128,528	2,656,903	1886.....	43,714	903,651			
1863.....	189,318	3,913,563	1887.....	33,553	693,709	1911.....	238,496	4,930,145
1864.....	180,722	3,735,850	1888.....	29,834	616,731	1912.....	251,815	5,205,485
1865.....	168,887	3,491,205	1889.....	28,489	588,923	1913.....	297,459	6,149,027
			1890.....	23,918	494,436	1914.....	252,730	5,224,393
1866.....	128,779	2,662,106				1915.....	273,376	5,651,184
1867.....	120,012	2,480,868	1891.....	20,792	429,811			
1868.....	114,792	2,372,972	1892.....	19,327	399,525	1916.....	219,633	4,540,216
1869.....	85,865	1,774,978	1893.....	18,360	379,535	1917.....	153,742	2,764,693
1870.....	64,675	1,336,956	1894.....	25,664	530,530	1918.....	180,163	3,724,300
			1895.....	61,289	1,266,954	1919.....	167,252	3,457,406
1871.....	87,048	1,799,440				1920.....	124,808	2,580,010
1872.....	77,931	1,610,972	1896.....	86,504	1,788,206			
1873.....	63,166	1,305,749	1897.....	131,805	2,724,657	1921.....	150,792	3,117,147
1874.....	89,233	1,844,618	1898.....	142,215	2,939,852	1922.....	207,370	4,286,718
1875.....	119,724	2,474,904	1899.....	203,295	4,202,473	1923.....	200,140	4,137,261
			1900.....	228,916	4,732,105	1924.....	245,719	5,079,462
1876.....	86,429	1,786,648				1925.....	219,227	4,531,824
1877.....	77,796	1,608,182	1901.....	257,292	5,318,703			
1878.....	61,688	1,275,204	1902.....	288,383	5,961,409	1926.....	225,866	4,669,065
1879.....	62,407	1,290,058	1903.....	284,108	5,873,036	1927.....	183,094	3,784,889
1880.....	49,044	1,013,827	1904.....	275,975	5,704,908			
1881.....	50,636	1,046,737	1905.....	285,529	5,902,402	Total.....	9,875,722	204,149,330

*Calculated from the value: one dollar = 0.048375 ounces.

Table 136.—Production of Gold,* in British Columbia by Districts, 1926 and 1927

(From Annual Report of the Minister of Mines for British Columbia)

District and division	1926				1927			
	Gold alluvial*		Gold lode		Gold alluvial*		Gold lode	
	Ounces	Value	Ounces	Value	Ounces	Value	Ounces	Value
		\$		\$		\$		\$
Northwestern District (No. 1)—								
Atlin.....	2,607	44,318	7,757	160,351	2,428	41,276	2,030	41,964
Stikine.....								
Liard.....	624	10,608			365	6,205		
Nass River.....			7,906	163,431			4,960	102,532
Portland Canal.....			124,207	2,567,582			122,242	2,526,962
Skeena.....			11,128	230,036	105	1,785	56	1,158
Queen Charlotte.....								
Bella Coola.....								
Northeastern District (No. 2)—								
Cariboo.....	10,059	170,993			3,125	53,125		
Quesnel.....	7,149	121,535			2,319	39,423		
Omineca.....	59	1,000	439	9,075	236	4,012	165	3,411
Peace River.....	88	1,500			177	3,009		
Central District (No. 3)—								
Nicola.....			12	248				
Vernon.....					3	51	6	124
Yale.....	29	500	59	1,220	30	510		
Ashcroft.....	15	250					1	21
Kamloops.....	18	302	125	2,584	5	85	326	6,739
Lilloet.....	29	500	4,580	94,677	59	1,003	5,979	123,596
Clinton.....	68	1,155			133	2,261		
Southern District (No. 4)—								
Grand Forks.....			20	413			1	21
Greenwood.....			166	3,432			114	2,357
Osoyoos.....			16,280	336,537			12,851	265,653
Similkameen.....	96	1,621	3,988	82,439	59	1,003	4,031	83,328
Eastern District (No. 5)—								
Fort Steele.....	29	500	321	6,636	126	2,142	939	19,411
Windermere.....								
Golden.....	13	221			21	357		
Ainsworth.....			26	537			123	2,542
Slocan.....			139	2,873			176	3,638
Slocan City.....								
Nelson.....			6,671	137,902			7,035	145,426
Arrow Lake.....								
Trail Creek.....			7,600	157,106				
Revelstoke.....							6,625	136,951
Trout Lake.....	29	500						
Lardeau.....			8	165			1	21
Western District (No. 6)—								
Nanaimo.....							2	41
Alberni.....								
Clayoquot.....								
Quatsino.....								
Victoria.....								
New Westminster.....								
Vancouver.....			9,995	206,615			10,336	213,664
Total.....	20,912	355,503	201,427	4,163,859	9,101	156,247	178,001	3,679,601

*Alluvial gold is valued at \$17 an ounce, which is believed to be a fair average for the whole province.

(a) In the statistics reported by the British Columbia Provincial Bureau of Mines the quantity given for gold production is based on the *metal content of ores shipped* and is somewhat higher than the records of *smelter recoveries* used by the Dominion Bureau of Statistics.

YUKON

Table 137.—Production of Gold from the Yukon, 1885-1927

Year	Fine ounces *	Value	Year	Fine ounces *	Value	Year	Fine ounces *	Value
		\$			\$			\$
1885)								
1886).....	4,837	100,000	1901.....	870,750	18,000,000	1916.....	212,700	4,396,900
1887.....	3,386	70,000	1902.....	701,437	14,500,000	1917.....	177,667	3,672,703
1888.....	1,935	40,000	1903.....	592,594	12,250,000	1918.....	102,474	2,118,325
1889.....	8,466	175,000	1904.....	507,938	10,500,000	1919.....	90,705	1,875,039
1890.....	8,466	175,000	1905.....	381,001	7,876,000	1920.....	72,778	1,504,455
1891.....	1,953	40,000	1906.....	270,900	5,600,000	1921.....	65,994	1,364,217
1892.....	4,233	87,500	1907.....	152,381	3,150,000	1922.....	54,456	1,125,705
1893.....	8,514	176,000	1908.....	174,150	3,600,000	1923.....	60,144	1,243,287
1894.....	6,047	125,000	1909.....	191,565	3,960,000	1924.....	34,825	719,897
1895.....	12,094	250,000	1910 (a).....	221,091	4,570,362	1925.....	47,817	988,465
1896.....	14,513	300,000	1911.....	224,197	4,634,574	1926 (b).....	25,601	529,220
1897.....	120,937	2,500,000	1912.....	268,447	5,549,296	1927.....	30,935	639,483
1898.....	483,750	10,000,000	1913.....	282,838	5,846,780			
1899.....	774,000	16,000,000	1914.....	247,940	5,125,374			
1900.....	1,077,553	22,275,000	1915.....	230,173	4,758,098	Total.....	8,824,182	182,411,650

(*) Calculated from the value: one dollar=0.048375 ounces.

(a) Includes a small production from lode mines, from 1910 to 1923 inclusive.

(b) Includes a small production from lode mines in 1926.

Table 138.—Receipts from the Yukon, at the Dominion of Canada Assay Office, Vancouver, B.C., 1908-1927

Year	Weight before melting	Net value	Average value	Year	Weight before melting	Net value	Average value
	Ounces	\$	\$		Ounces	\$	\$
1908 (a).....	60,132.00	1,000,296	16.63	1918.....	121,310.37	1,921,198	15.84
1909.....	5,003.12	83,871	16.75	1919.....	111,138.65	1,813,883	16.32
1910.....	3,594.87	62,094	17.27	1920.....	74,456.01	1,206,579	16.21
1911.....	2,073.61	34,944	16.88	1921.....	82,219.92	1,340,225	16.30
1912.....	2,211.88	36,481	16.41	1922.....	69,161.19	1,126,702	16.29
1913 (b).....	15,235.29	247,189	16.22	1923.....	73,360.82	1,201,133	16.37
1914.....	56,564.83	915,914	16.21	1924.....	44,365.96	717,156	16.17
1915.....	87,040.87	1,418,497	16.28	1925.....	61,096.43	977,624	16.00
1916.....	95,005.82	1,525,724	16.06	1926.....	32,686.16	537,822	16.46
1917.....	79,532.35	1,262,207	15.87	1927.....	39,436.44	649,402	16.47

(a) For nine months only.

(b) The removal in 1913 of the assay charge, accounts for the great increase.

Table 139.—Production of Alluvial Gold in the Yukon by Months, 1925-1927

(Gross weight of dust, nuggets, and bullion in ounces)

Month	1925	1926	1927
January.....	1,483.60	4.32	550.09
February.....	999.38		4.00
March.....	30.50	175.64	1,112.59
April.....			
May.....		2,666.27	973.34
June.....	4,988.62	3,219.01	5,480.34
July.....	10,052.62	4,293.52	4,335.22
August.....	5,051.47	4,280.60	8,695.88
September.....	27,166.78	5,554.27	6,604.03
October.....	7,626.72	6,611.83	6,584.82
November.....	413.70	3,000.23	2,116.05
December.....	1,958.08	1,874.53	2,016.09
Total.....	59,771.47	31,680.23	38,472.45

From 1898 to March 31, 1928, royalties to the extent of \$4,927,598.21 were collected on the gold production of the Yukon. The yearly amounts collected, as well as the annual production of gold as ascertained by the *Department of the Interior*, are shown below. The difference between these figures and those shown in the table of annual production, which are based on mint receipts of Yukon gold is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at \$15 per ounce, (2) the probability that, in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small production from lode mines.

Table 140.—Gold Production in the Yukon and the Royalty Collected, 1898-1928

(Supplied by Superintendent H. H. Rowatt, of the Mining Lands Branch of the Department of the Interior.)

Fiscal year	Total gold production	Total exemption	Royalty collected on	Royalty paid
	\$	\$	\$	\$
Ending June, 1898.....	3,072,773	339,845	2,732,928	273,292.82
Ending June, 1899.....	7,582,283	1,699,657	5,882,626	588,262.37
Ending June, 1900.....	9,809,464	2,601,744	7,207,720	730,771.99
Ending June, 1901.....	9,162,082	1,927,666	7,234,416	592,660.98
Ending June, 1902.....	9,566,340	1,199,114	8,367,226	331,436.79
Ending June, 1903..... Since 1902, the Dominion Government has.....	12,113,015		12,113,015	302,893.48
Ending June, 1904..... collected a royalty of 2½ per cent on all gold.....	10,790,663		10,790,663	272,217.96
Ending June, 1905..... produced; the Government for royalty pur.....	8,222,054		8,222,054	206,760.87
Ending June, 1906..... poses, places a nominal value of \$15 on each.....	6,540,007		6,540,007	163,963.25
Ending March, 1907..... crude ounce recovered.....	3,304,791		3,304,791	82,622.42
Ending March, 1908.....	2,820,162		2,820,162	70,504.65
Ending March, 1909.....	3,260,282		3,260,282	81,507.07
Ending March, 1910.....	3,594,251		3,594,251	89,844.10
Ending March, 1911.....	4,126,728		4,126,728	103,168.19
Ending March, 1912.....	4,024,237		4,024,237	100,606.29
Ending March, 1913.....	5,018,412		5,018,412	125,460.52
Ending March, 1914.....	5,301,508		5,301,508	132,537.69
Ending March, 1915.....	4,649,634		4,649,634	116,241.04
Ending March, 1916.....	4,458,278		4,458,278	111,457.19
Ending March, 1917.....	3,960,207		3,960,207	99,007.92
Ending March, 1918.....	3,266,019		3,266,019	81,650.55
Ending March, 1919.....	1,947,082		1,947,082	48,677.07
Ending March, 1920.....	1,660,450		1,660,450	41,501.12
Ending March, 1921.....	1,246,486		1,246,486	31,273.76
Ending March, 1922.....	1,230,987		1,230,987	30,774.68
Ending March, 1923.....	1,032,762		1,032,762	25,819.04
Ending March, 1924.....	1,136,368		1,136,368	28,409.23
Ending March, 1925.....	625,459		625,459	15,636.48
Ending March, 1926.....	879,819		879,819	21,995.50
Ending March, 1927.....	497,504		497,504	12,437.64
Ending March, 1928.....	568,221		568,221	14,205.55
Total.....	135,468,328		127,800,302	4,927,598.21

IMPORTS AND EXPORTS

Table 141.—Imports into Canada and Exports of Gold, 1925-1927

	1925	1926	1927
	\$	\$	\$
IMPORTS—			
Coin and bullion—			
Coins, British, Canadian and foreign gold coins.....	49,477,383	45,077,807	30,510,813
Gold bullion, in bars, blocks, ingots, drops, sheets or plates, unmanufactured....	1,031,597	2,048,033	745,820
Total.....	50,508,980	47,125,840	31,256,633
Gold, other—			
Bullion or fringe gold.....	27,215	34,836	31,076
Manufactures of gold and silver—			
Leaf.....	76,364	87,597	98,452
Sweepings.....	2,282	2,676	240
Manufacturers, n.o.p.....	147,839	68,514	85,477
Electroplated ware.....	707,726	846,216	1,013,799
Medals of gold, silver or copper, and other metallic articles, actually bestowed as trophies or prizes, and received and accepted as honorary distinctions, and cups or other metallic prizes won in bona fide competitions.....		21,006	18,365
Total.....	961,426	1,069,845	1,247,409
EXPORTS—			
Coin and bullion—			
Gold coin—			
Canadian.....		4,000,000	1,005
Foreign.....	3,026	24,010,603	42,003,384
Gold bullion—			
Canadian.....	333,090	41,812,356	5,019,346
Foreign.....			
Total—Canadian.....	333,090	45,812,356	5,020,351
Foreign.....	3,026	24,010,603	42,003,384
Gold-bearing quartz, dust, nuggets and bullion obtained direct from mining operations.....	31,432,647	7,340,451	7,881,512

WORLD OUTPUT

Table 142.—Comparative Figures of Gold Production, for the World, Africa and Canada, 1915, and 1921-1927

*From the Year Book of the American Bureau of Metal Statistics.

Year	*World's output	*Africa's output	Canada's output
	Fine ounces	Fine ounces	Fine ounces
1915.....	22,593,833	10,538,588	918,056
1921.....	15,983,772	9,044,595	926,329
1922.....	15,444,830	8,009,069	1,263,364
1923.....	17,786,471	10,156,522	1,233,341
1924.....	19,023,134	10,622,168	1,525,382
1925.....	19,031,137	10,582,493	1,735,735
1926.....	19,321,416	10,973,077	1,754,228
1927.....	19,433,552	11,111,281	1,852,785

Table 143.—World Production of Gold, (a) 1913 and 1923-1927

(From the Year Book of the American Bureau of Metal Statistics, 1927)

(Fine ounces)

	1913	1923	1924	1925	1926	1927
NORTH AMERICA—						
United States.....	4,299,784	2,502,632	2,528,900	2,411,987	2,335,042	2,178,389
Canada.....	802,973	1,233,341	1,525,382	1,735,735	1,754,228	1,844,544
Mexico.....	829,783	776,808	792,401	788,993	772,661	725,125
Total North America.....	5,932,540	4,512,781	4,846,683	4,936,715	4,861,931	4,748,058
Central America and West Indies.....	131,661	96,750	87,075	96,750	87,075	* 85,000
SOUTH AMERICA—						
Bolivia.....	8,467	407	964	386	332	.....
Chili.....	.....	105,549	112,011	105,870	115,579	.....
Brazil.....	109,072	144,675	120,824	120,337	102,108	.....
Colombia.....	143,757	275,738	96,750	76,750	75,488	.....
Ecuador.....	19,665	42,456	38,700	43,537	62,486	.....
Peru.....	23,813	120,372	118,955	109,965	91,917	.....
Guiana—British.....	65,475	7,262	7,187	9,107	7,450	.....
Dutch.....	22,757	12,731	10,352	9,902	7,526	.....
French.....	147,571	44,624	63,496	40,220	42,438	.....
Venezuela.....	21,517	17,361	17,361	30,542	30,542	.....
Other countries.....	1,572	3,881	2,915	2,661	2,419	.....
Total South America.....	563,666	775,056	589,515	549,277	538,285	* 550,000
EUROPE—						
Austria-Hungary.....	105,425	739	1,961	1,865	1,318	.....
Czecho-Slovakia.....	.....	3,344	9,002	7,587	7,716	.....
France.....	102,912	16,943	19,804	33,950	35,365	.....
Great Britain.....	864	.....	.....	.....	.....	.....
Roumania.....	.....	48,225	42,149	40,027	40,605	.....
Russia and Siberia.....	1,232,313	250,673	958,070	935,154	992,155	.....
Other countries.....	24,290	11,351	18,070	17,266	19,227	.....
Total Europe.....	1,515,804	331,275	1,049,956	1,085,849	1,096,386	* 1,200,000
AUSTRALASIA—						
New South Wales.....	149,657	18,833	18,685	19,422	19,435	18,032
Queensland.....	265,735	88,726	98,841	46,406	10,339	35,086
South Australia.....	6,556	950	880	832	758	*800
Victoria.....	434,932	95,403	67,187	47,296	49,078	38,538
West Australia.....	1,314,043	504,511	485,035	441,252	437,343	408,344
New Zealand.....	343,595	164,408	122,341	114,696	125,777	122,000
Tasmania.....	33,400	3,684	4,625	3,524	4,223	4,861
Other countries.....	21,393	12,741	2,391	5,466	6,541	6,500
Total Australasia.....	2,569,311	889,256	799,965	678,894	653,494	634,161
ASIA—						
British India.....	589,109	383,697	396,349	393,807	383,970	386,252
China.....	176,999	89,500	107,300	107,300	110,000	*100,000
Chosen (Korea).....	173,306	121,433	134,128	146,825	190,620	*190,000
British East Indies.....	65,402	29,025	24,187	24,187	19,350	*19,400
Dutch East Indies.....	163,852	115,547	124,388	132,715	115,354	*115,400
Formosa.....	39,406	21,958	8,653	9,035	9,035	*9,000
Japan.....	174,846	247,266	244,500	273,085	267,800	*270,000
Other countries.....	24,596	16,405	16,167	15,205	15,039	*15,000
Total Asia.....	1,407,516	1,024,831	1,055,672	1,101,159	1,111,168	1,105,052
AFRICA—						
Belgian Congo.....	44,334	91,306	118,119	122,781	132,201	*135,000
Madagascar.....	60,769	16,686	10,802	13,503	9,870	*10,000
Rhodesia.....	690,541	649,082	628,974	582,752	594,208	*581,790
British West Africa.....	384,836	200,565	233,910	199,697	220,000	*200,000
Transvaal, Cape Colony and Natal.....	8,798,713	9,149,073	9,575,040	9,597,592	9,954,762	10,122,491
Other countries.....	45,623	49,810	55,323	66,168	62,036	*62,000
Total Africa.....	10,024,816	10,156,522	10,622,168	10,582,493	10,973,077	11,111,251
Grand Total.....	22,145,314	17,786,471	19,050,134	19,031,137	19,321,416	19,433,552

(a) 1913-1925 as reported by the Director of the Mint with some changes. 1926 and 1927 as compiled by the American Bureau of Metal Statistics.

† Preliminary estimate. Final production as shown in Table 1 was 1,852,785 ounces.

* Conjectural figures based on the 1926 outputs. Production of the Philippine Islands is included with the United States.

CHAPTER FOUR—THE SILVER MINING INDUSTRY IN CANADA

Including the Silver-Cobalt Mining Industry, the Silver-Lead-Zinc Mining Industry, and Commodity Statistics Tables on Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review.
2. The Silver-Cobalt Mining Industry.
3. The Silver-Lead-Zinc Mining Industry.
4. Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review

(a) *Definition of the Industry.*—Silver mining is not a distinct industry in Canada, as silver is found only in association with other metals; with lead and zinc, particularly, in western Canada, with cobalt in northern Ontario, and with lode and placer gold, copper and other metals in various localities. Industrial reviews concerning the production of silver must therefore consider the various sources of supply, and general statistics on this subject should relate to each of the contributing sections of the mining industry. Silver-lead-zinc mining is a very important industry in British Columbia, the Yukon Territory, Quebec and, to a less extent, in Ontario, whereas the mining of silver-cobalt ores is carried on in Canada only in the province of Ontario. While silver is the predominating metal in some ores of the silver-lead-zinc group there are other mines which yield an ore carrying lead and zinc in greater values, so that the silver content is of secondary importance. Silver values are the governing feature in the silver-cobalt ores of Ontario. Alluvial and lode gold and ores containing copper and gold usually contain commercial values in silver also, but in these ores, the metals, other than silver, are generally of greater importance.

(b) *Historical.*—Silver production in Canada dates back many years, the earliest account being that of the finding of argentiferous-lead on the Quebec side of lake Timiskaming about 1686; it is somewhat remarkable that the Cobalt area lying within a short distance of this property, and one of the richest silver camps in the world, was not found until 1903. In 1868 Thomas McFarlane, working on a rock about 80 or 90 feet in diameter, off Thunder Cape, in lake Superior, discovered a vein containing galena and silver which was afterwards worked as the Silver Islet mine; this property yielded about 3.5 million dollars' worth of silver before it was flooded by the waters of the lake. Then in 1903 the next big find was made. Long lake, later called "Cobalt lake," was the centre of the area which became known as the "Cobalt Silver Camp." This camp and the allied camps of Gowganda and South Lorrain, have been in continuous operation since that time and to the end of 1927 have yielded upwards of 383 million ounces of silver.

In British Columbia the main source of silver for many years was from the silver-lead-zinc ores of the east and west Kootenay districts. These ores were complex and, because of the finely disseminated sulphides, were very hard to treat. The Consolidated Mining and Smelting Company of Trail, B.C., has been the pioneer in Canada in the treatment of these ores. For years the zinc content of British Columbia ores was regarded as detrimental, and treatment of these ores by the smelter could only be carried on profitably by the imposition of penalty charges based on the zinc content. But as the result of an exhaustive research, covering a period of years a method of concentrating and treatment was evolved whereby the ores could be handled more economically.

In the Yukon, the rich silver-lead ores of the Keno Hill district provide the principal source of the silver production from that section of Canada. Quebec province also, in the last few years, has added its quota in the output of these metals; considerable work is being done on prospects in the Gaspé Peninsula.

Nova Scotia and the prairie provinces have yielded only small quantities of these metals up to the present time, but development and investigational work is being carried on at a zinc property in Cape Breton Island and it is anticipated that Nova Scotia will soon be a contributing factor in Canada's zinc production.

(c) *Sources of Silver, Lead, Zinc, Cobalt and Arsenic.*—In 1927 the total production of silver from Canadian ores of all kinds amounted to 22,736,698 fine ounces and included (a) silver contained in silver and gold bullion produced, 8,386,144 fine ounces, or 36.8 per cent of the total, (b) silver contained in blister copper or lead bullion made, 8,091,741 fine ounces, or 35.6 per cent, and (c) silver estimated as recoverable from ores of all kinds exported for treatment in foreign smelters, 6,285,813 fine ounces, or 27.6 per cent.

The production of lead during the same year amounted to 311,423,161 pounds, an advance of 9.7 per cent above the previous high record of 283,801,265 pounds set up in 1926. Of the total the Trail smelter produced 291,524,037 pounds of lead contained in base bullion made; the remainder, 19,899,124 pounds, included lead estimated as recoverable from silver-lead-zinc ores shipped from the mines of the Yukon, and from the lead-zinc properties of Quebec, and pig lead made at Galetta in Ontario, with also small quantities of lead contained in silver-lead-bismuth bullion recovered by the smelters treating cobalt ores.

Zinc production during the same year amounted to 165,495,525 pounds, an increase of 10.4 per cent over the Canadian production of 149,938,105 pounds in 1926. Most of Canada's zinc output is in the form of metallic zinc produced by the Consolidated Mining and Smelting Company at Trail, B.C. The remainder represents zinc estimated as recoverable from ores and residues exported for treatment in foreign smelters.

For the past two decades the ores of the Cobalt district of Ontario have been the main source of the world's supply of cobalt, but in 1926, owing to the production of cobalt by the Union Minière du Haut Katanga, of Central Africa, where it occurs with copper ores, Canada's production was cut to 55 per cent of the world's output.

Computed as the sum of the cobalt contained in metal, oxides, salts, ores, concentrates and residues marketed in 1927, the production of cobalt in Canada amounted to 880,590 pounds valued at \$1,764,534.

Arsenic is produced in Canada from the cobalt-silver-nickel-arsenic ores of the Cobalt district by the smelter of the Deloro Smelting and Refining Company Limited, Deloro, Ontario. It is also contained in the concentrates shipped to the Tacoma smelter by the Nickel Plate gold mine of British Columbia, but owing to the low price prevailing during the past two years this company has had little or no return for the arsenic.

In 1927 the total production, calculated as As_2O_3 amounted to 6,227,968 pounds valued at \$211,979, as compared with 5,074,677 pounds valued at \$146,811 in 1926. Of the 1927 production, 4,894,547 pounds valued at \$196,335 was in the form of white arsenic, and 1,333,421 pounds valued at \$15,644 was the As_2O_3 contained in the arsenical concentrates and residues exported.

(d) *Importance of these Metals.*—Lead production in Canada holds fourth place, silver seventh place, and zinc tenth place in point of value among the metals and minerals produced. In 1927 Canada ranked third among the world's silver-producing countries; Mexico produced 104.6 million ounces; and the United States 59 million ounces. In the production of lead Canada was surpassed by the United States, Mexico and Australia. In smelter output of zinc, the United States had the highest production of any country, being followed by Belgium, Upper Silesia, Germany, France, and Canada in the order named. In the production of cobalt, Canada and Central Africa produced about equal amounts. From 1904 to 1910 the cobalt production figures represent an estimate of the cobalt content of the ores shipped from the mines, a large part of which was not recovered. From 1911 until the present time cobalt production is computed by adding the cobalt content of all cobalt metal oxides and salts sold by the Ontario smelters to the cobalt paid for in ores and residues exported for treatment in foreign smelters, thus representing a true figure of Canada's cobalt production since that time.

Reliable world's figures on the production of arsenic are very difficult to obtain, but the best available information is shown in Table 166. Because of its low price and the instability of demand, smelters operating long distances from the markets do not attempt its complete recovery.

2. The Silver-Cobalt Mining Industry

Mining and milling only are considered in this chapter: smelting of the cobalt ores, in so far as Canadian operations are concerned, is included in the chapter on "The Non-Ferrous Smelting and Refining Industry."

After the remarkable Silver Islet production, comparatively little silver was produced in Ontario until the discovery of the mineral wealth of the Cobalt area in 1903. From 1905, when the output of silver was over 2,000,000 ounces, the production increased rapidly until the peak year was reached in 1911. In that year Ontario's production of silver was 30,540,754 ounces. In the following year production declined to 29,000,000 ounces and thereafter followed a generally downward trend until 1921, when less than 10,000,000 ounces were reported; there has been little change in the volume of output during recent years.

Ontario is the only province producing cobalt and refined arsenic. Some of the older properties around Cobalt have been worked out, but new discoveries in South Lorrain, Gowganda and in the old Cobalt camp itself, assist in keeping production fairly constant. The increase in gold production also assists in Ontario's silver output, as the gold from the Porcupine and Kirkland Lake camps carries an average of 16 ounces of silver to every 100 ounces of gold. A small amount of silver is also obtained as a refinery by-product from the nickel-copper ores of the Sudbury district.

In 1927 there were 21 silver-cobalt mines producing, or shipping from old dumps. Of these 13 were operating in the Cobalt area, 5 in South Lorrain and 3 in the Gowganda district. The Nipissing mine was the principal silver producer in this group. Other large mines in order of production were—Mining Corporation, Keeley, Castle Tretheway, Frontier Lorrain and O'Brien.

The Nipissing Mining Company, Limited, was the only mining company in Ontario producing refined silver in 1927. Other mines in the district shipped ore to the Nipissing mill, to the mill of the Cobalt Reduction Company, to the Deloro Smelting and Refining Company, and to foreign smelters.

The output of ores from these mines was 303,134 tons; the quantity milled amounted to 304,534 tons and the concentrates produced totalled 5,533 tons. There were 78,838 tons cyanided; silver bullion production from the cyanide process amounted to 1,927,529 fine ounces and silver produced by the direct smelting of nuggets, 126,462 fine ounces.

Shipments of ores and concentrates to Canadian smelters amounted to 3,793 tons and to European and United States smelters, 2,714 tons, a total of 6,507 tons in 1927, as against 7,752 tons in 1926. The total value of shipments including bullion was \$4,760,546 as against \$5,470,433 in 1926.

Capital employed in the silver-cobalt mining industry in 1927 amounted to \$30,123,645, of which \$23,815,697 was invested in lands, buildings, plant machinery and tools, \$1,024,241 represented cost of supplies and stock on hand, and \$5,283,707 was in cash, trading and operating accounts and bills receivable.

Salaried officials numbered 109 in 1927 as against 156 in 1926. Wage-earners averaged 1,349 persons, of whom 860 were employed underground, 284 on the surface and 205 in the mills. Salaries and wages totalled \$2,178,163. Fuel used cost \$472,548 at the mines, which sum included \$309,338 for electric power. Power equipment employed, exclusive of boilers, consisted of 225 units, having a total rating of 8839 h.p. Boilers numbered 20 with a total rating of 1,450 h.p.

Table 144.—*Principal Statistics of the Silver-Cobalt Mining Industry in Canada, 1923-1927

Year	Number of active operators	Number of operating mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates and residues shipped
			\$		\$	\$	\$
1923.....	18	24	31,334,050	1,408	1,949,738	410,089	6,521,853
1924.....	26	34	41,013,466	1,769	2,534,304	468,651	6,594,032
1925.....	33	38	44,045,619	1,788	2,576,414	498,874	6,611,644
1926.....	33	37	40,504,721	1,779	2,815,930	518,907	5,470,433
1927.....	23	26	30,123,645	1,458	2,178,163	472,548	4,760,546

* All plants in this industry are located in Ontario.

Table 145.—Statistics of Silver-Cobalt Mine and Mill Operations in Canada, 1926 and 1927

	Unit of measure	1926	1927
Number of mines in operation.....		37	26
Ore mined.....	Tons	336,096	303,134
Ores treated.....	Tons	326,510	304,534
Tailings treated.....	Tons	6,095	21
Concentrates produced.....	Tons	83,980	5,533
Quantity of material cyanided.....	Tons	2,991,440	1,927,529
Bullion recovered.....	Fine ounces		126,462
Bullion recovered by direct smelting.....	Fine ounces	3,094,391	2,040,070
Bullion sold.....	Fine ounces		
Net value of bullion.....	\$	1,924,693	1,151,544

Table 146.—Shipments of Ores, Concentrates and Residues from the Cobalt Camp, Ontario, 1926 and 1927

Kind	Quantity	Gross value (a)	Net value (b)	Metallic content paid for		
				Silver	Cobalt	Copper
	Tons	\$	\$	fine oz.	lb.	lb.
1926						
<i>To Canadian Smelters—</i>						
Ores.....	759	1,618,222	1,441,851	2,389,598	314,834	.....
Concentrates and residues.....	3,996	1,616,252	1,520,009	2,651,587	435,063	.....
<i>To Foreign Smelters—</i>						
Concentrates and residues.....	2,997	618,879	583,880	926,857	364,448	69,502
Total.....	7,752	3,853,353	3,545,740	5,968,042	1,114,345	69,502
1927						
<i>To Canadian Smelters—</i>						
Ores.....	677	1,040,956	976,040	1,749,680	133,947	.....
Concentrates.....	3,116	2,372,917	2,199,456	4,123,078	295,463	.....
<i>To Foreign Smelters—</i>						
Concentrates and residues.....	2,714	458,014	433,506	713,010	141,875	40,860
Total.....	6,507	3,871,887	3,609,002	6,585,765	571,285	40,860

(a) Gross value means value of the metals paid for before deducting transportation and treatment charges, and include exchange premium received.

(b) Net value is actual amount received by operator.

Table 147.—Capital Employed in the Silver-Cobalt Mining Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings, and equipment.....	31,412,576	23,815,697
Cost of supplies and stock on hand.....	998,390	1,024,241
Cash, trading and operating accounts and bills receivable.....	8,093,755	5,283,707
Total.....	40,504,721	30,123,645

Table 148.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1926 and 1927

	1926		1927	
	Number	Salaries and wages	Number	Salaries and wages
		\$		\$
SALARIED EMPLOYEES—				
Total.....	156	400,403	109	285,493
WAGE-EARNERS—				
Surface.....	428	2,415,527	284	1,892,665
Underground.....	943		860	
Mill.....	252		205	
Total.....	1,623	2,415,527	1,349	1,892,665
Total.....	1,779	2,815,930	1,458	2,178,158

Table 149.—Wage-Earners in the Silver-Cobalt Mining Industry in Canada by Months, 1926 and 1927

Month	1926				1927			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	402	874	220	1,496	303	904	211	1,418
February.....	373	877	206	1,456	267	870	210	1,347
March.....	371	911	219	1,501	281	838	211	1,360
April.....	352	915	211	1,478	287	869	205	1,361
May.....	381	887	212	1,480	286	849	204	1,339
June.....	417	875	198	1,490	309	861	200	1,370
July.....	415	878	208	1,501	281	814	183	1,278
August.....	434	866	233	1,533	267	789	170	1,226
September.....	459	894	239	1,592	237	758	160	1,155
October.....	449	870	241	1,560	242	774	161	1,177
November.....	382	859	237	1,478	231	751	162	1,144
December.....	334	845	247	1,426	222	720	164	1,066

Table 150.—Fuel and Electricity Used in the Silver-Cobalt Mining Industry in Canada, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous Coal (a) Canadian.....	Ton	{			
(b) Imported.....	Ton				
Anthracite coal.....	Ton	910	14,630	854	14,004
Coke.....	Ton	93	1,141	89	1,127
Gasoline.....	Imp. gal.	32,273	11,912	6,480	1,975
Kerosene.....	Imp. gal.			150	37
Fuel oil and diesel oil.....	Imp. gal.	128,655	19,526	84,548	12,263
Wood.....	Cord	3,893	19,518	2,041	12,271
Other fuel.....			29,433		30,521
Electricity purchased.....	KW.H.	10,929,461	310,806	17,251,738	309,338
Total.....			518,907		472,548

Table 151.—Power Employed in the Silver-Cobalt-Mining Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	13	665	10	620
Gasoline, gas and oil engines.....	4	525	2	130
Hydraulic turbines and water wheels.....				
<i>Total primary power.....</i>	17	1,190	12	750
Electric motors run by purchased power.....	207	8,054	213	8,089
Total power employed.....	224	9,244	225	8,839
Electric motors run by primary power in same plant.....	1	4		
<i>Total electric motors.....</i>	208	8,058	213	8,089
Boilers.....	27	1,600	20	1,450

3. The Silver-Lead-Zinc Mining Industry

CANADA

Producing, concentrating, smelting and refining of ores of the silver-lead-zinc group is an industry that is fairly well confined to the province of British Columbia; but as already noted there are silver-lead properties in the Yukon, lead at the Galetta property in Ontario and silver-lead-zinc at Notre Dame des Anges in Quebec.

The Consolidated Mining and Smelting Company, Limited, of Trail, B.C., in addition to buying ores and concentrates for the smelter, operate a large customs concentrator which is of great assistance to the smaller mines within a reasonable shipping distance.

As defined above, the silver-lead-zinc industry was represented by 173 mines operated by 157 concerns in 1927. Ore raised from these mines totalled 1,763,660 tons and 1,914,101 were milled. Shipments of lead ores, lead concentrates, zinc ore, zinc concentrates and dry ore from the mines during the year totalled 490,846 tons valued at \$17,520,130. As determined by settlement assay, the total metal contents of these shipments included 22,510 ounces of gold, 9,664,673 ounces of silver, 321,092,812 pounds of lead, and 226,362,997 pounds of zinc.

Comparable statistics for 1926 show that 127 mines operated by 108 concerns raised 1,565,158 tons of ore of which 1,529,259 tons were milled, yielding 180,919 tons of lead concentrates and 190,681 tons of zinc concentrates. Shipments of lead ores, lead concentrates, zinc ore, zinc concentrates and dry ore from the mines during 1926 totalled 498,015 tons valued at \$26,190,034. As determined by settlement assay the total metal content of these shipments included 6,243 ounces of gold, 9,524,925 ounces of silver, 290,349,316 pounds of lead and 218,166,261 pounds of zinc.

Capital employed in this industry in 1927 was \$28,036,330 including over 20 million dollars in costs of buildings, plant, machinery and tools, about 2 million dollars for costs of supplies and stocks on hand, and 5.5 million dollars in cash, trading and operating accounts. Salaries totalling over \$468,827 were paid to 229 people, and wages amounting to over 4 million dollars were distributed among 2,877 workers. About two-thirds of the capital invested and more than 70 per cent of the total salaries and wages paid in the industry, were reported by British Columbia operators, thus lending emphasis to the statement made above regarding the importance of silver-lead-zinc mining in British Columbia. Fuel used during the year cost \$588,520 including \$265,695 paid for electric power. In addition, 11,295,285 k.w.h. was generated by the mines for their own use.

QUEBEC

Mining of silver-lead-zinc ores in Quebec is carried on in the vicinity of Notre Dame des Anges where ore was discovered in 1910. Several early attempts to concentrate this ore failed but more recently, as the result of a selective flotation process, worked out by the *Mines Branch*, Ottawa, about the end of 1924, economic recovery of silver-lead-zinc has been successful. During 1927 there were 29,721 tons of lead and zinc concentrates shipped to European smelters.

ONTARIO

Although a small amount of lead is produced from the silver-cobalt ores, the greater part of Ontario's lead production is derived from the lead mine at Galetta in Carleton county. The ore of this mine carried no silver and only a small amount of zinc. A separation is made of the zinc and lead concentrates, the zinc concentrates being accumulated for shipment to foreign smelters; the galena is smelted to high-grade pig lead on the property.

BRITISH COLUMBIA

In 1927 British Columbia held first place among the silver-producing provinces, and first place among the provinces producing lead and zinc. About 30 per cent of the Dominion total of silver, 94 per cent of the lead, and 89 per cent of the zinc were obtained from the smelting of silver-lead-zinc ores mined in British Columbia. In this province production of these three metals has increased remarkably during the past five years. With the early development of the silver-lead ores of the Kootenays, silver production reached about the 5-million ounce mark in 1897, only to fall away to about 3 million ounces in 1899. Again, in 1901, the 5-million ounce mark was reached but in 1911 production had fallen to less than 2 million ounces. From that time forward, the output increased; first, through the demand created by the war, and later as a result of the development of the Premier mine in northern British Columbia.

Application of flotation methods in the treatment of silver-lead-zinc ores enabled producers to increase their mine outputs. Another factor contributing to the growth was the rise in the prices of lead and zinc and the maintenance of these prices at generally high levels. Increased production of the famous Sullivan lead and zinc mine also added appreciably to the silver output; indeed, this mine though nominally a lead-zinc property was, in 1927, the largest silver-producing mine in Canada.

The Trail smelter buys silver-lead-zinc ores, but much silver and some lead are also contained in ores exported by the mines on the coast; most of these ores are mined primarily for their copper and gold values, but the other associated metals, including silver, are recovered in the smelting process.

YUKON

In the Yukon the Keno Hill district is the principal producer of silver and lead. According to a report given to the *Mining Lands Branch* of the Department of the Interior by the Gold Commissioner of the Yukon, it has been shown that ore values continue with depth. In 1927 seventeen mines were reported as having shipped ore and concentrates. The Treadwell-Yukon Company, the largest producer in the district, completed a concentrator in the summer of 1925 that has worked to full capacity since it was built. Ores from neighbouring mines are treated in the mill, and this feature is much appreciated by the smaller operators who have thus been able to continue development work with the proceeds from the sales of their ores.

Table 152.—Principal Statistics in the Silver-Lead-Zinc Mining Industry in Canada, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of ores and concentrates sold
			\$		\$	\$	\$
1923.....	89	93	9,203,997	1,352	2,024,752	257,574	6,620,067
1924.....	82	94	12,328,511	1,936	2,943,635	474,343	16,600,970
1925.....	89	94	15,735,930	2,538	3,867,613	584,121	21,902,686
1926.....	108	127	22,699,417	2,924	4,431,730	658,679	26,190,034
1927.....	157	173	28,036,330	3,106	4,807,817	588,520	17,520,130

Table 153.—Shipments of Lead Ores and Concentrates from Canadian Mines, 1913-1927

Year	Shipment		Lead content in pounds	Silver content in ounces
	Tons	Value		
		\$		
1913.....	85,978	3,276,812	53,807,570	2,564,155
1914.....	70,207	2,652,802	50,527,130	2,501,820
1915.....	73,752	2,958,394	48,708,005	2,954,175
1916.....	84,516	4,568,500	54,124,628	2,582,952
1917.....	46,799	3,866,862	38,696,116	1,670,064
1918.....	75,256	4,705,573	46,843,602	2,314,542
1919.....	54,508	3,044,839	32,147,989	2,185,376
1920.....	69,493	2,985,848	36,325,507	2,882,178
1921.....	15,259	671,313	9,517,616	989,374
1922.....	27,203	1,803,575	21,335,850	2,163,637
1923.....	76,886	4,692,755	66,770,926	3,745,129
1924.....	153,396	12,290,699	180,187,124	4,348,243
1925.....	208,588	15,420,756	237,675,311	6,024,213
1926.....	255,048	17,546,728	273,963,827	8,616,164
1927.....	275,328	13,044,514	308,903,620	8,831,840

Table 154.—Shipments of Zinc Ores and Concentrates from Canadian Mines, 1898-1927

Year	Shipments		Metallic zinc shipped	Year	Shipments		Metallic zinc shipped
	Tons	Value			Tons	Value	
		\$	Pounds			\$	Pounds
1898.....	1,162	11,000	788,000	1913.....	7,889	186,827	7,069,800
1899.....	865	18,165	814,000	1914.....	10,893	262,563	9,101,460
1900.....	261	4,810	212,000	1915.....	14,895	554,938	12,231,439
1901*				1916.....	82,077	1,086,249	48,498,078
1902.....	158	1,650	142,200	1917.....	116,459	1,323,985	64,655,713
1903.....	1,000	10,500	900,000	1918.....	121,200	1,228,195	63,026,464
1904.....	597	3,700	477,568	1919.....	135,535	1,049,493	59,959,709
1905.....	9,413	139,200	*	1920.....	249,136	1,157,844	91,033,202
1906.....	1,154	23,800	*	1921.....	297,406	1,498,716	98,799,093
1907.....	1,573	49,100	*	1922.....	356,096	2,357,849	102,975,964
1908.....	452	3,215	*	1923.....	279,229	1,853,114	96,148,734
1909†	18,371	242,699	16,468,204	1924.....	191,369	4,310,271	129,643,631
1910.....	5,063	120,003	4,361,712	1925.....	173,172	6,481,930	153,980,628
1911.....	2,590	101,072	2,346,849	1926.....	242,967	8,643,306	188,393,028
1912.....	6,415	215,149	5,354,700	1927.....	204,823	4,383,586	196,210,320

* Figures not available. † Includes 7,424 tons shipped late in 1908.

Table 155.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry, in Canada, 1926 and 1927

Production	Quebec and Ontario	British Columbia	Yukon	Canada
1926	Tons	Tons	Tons	Tons
Ore mined.....	241,444	1,277,016	46,698	1,565,158
Ore milled.....	255,657	1,229,505	44,097	1,529,259
Concentrates produced—lead.....	7,893	170,213	2,813	180,919
Concentrates produced—zinc.....	16,207	174,474	.....	190,681
1927				
Ore mined.....	307,771	1,390,311	65,578	1,763,660
Ore milled.....	329,324	1,520,677	64,100	1,914,101
Concentrates produced—lead.....	11,721	192,626	5,491	209,838
Concentrates produced—zinc.....	21,844	180,989	.....	202,833

Table 156.—Products Shipped by Silver-Lead-Zinc Mines in Canada, 1926 and 1927

Location of mines	No. of mines shipping	Products shipped	Quantity shipped	Net value at shipping point	Total metal content as determined by settlement assay			
					Gold	Silver	Lead	Zinc
Canada			Tons	\$	Oz.	Oz.	Lb.	Lb.
1926								
Quebec and Ontario.	2	Lead ores.....	.....	.....	.....	.....	.....	.....
		Lead concentrates.....	8,755	725,709	2,190	280,311	11,490,219	405,120
		Zinc concentrates.....	16,195	703,000	2,000	134,766	421,070	16,130,220
		Total.....	24,950	1,428,709	4,190	415,077	11,911,289	16,535,340
British Columbia....	88	Lead ore.....	64,696	2,646,294	1,255	1,836,211	31,829,836	10,683,632
		Lead concentrates.....	170,313	12,799,797	292	4,185,244	224,719,733	18,656,605
		Zinc ore.....	52,507	982,358	165	274,839	3,478,938	14,133,599
		Zinc concentrates.....	174,265	6,957,948	2	499,156	12,485,481	158,129,209
		Dry ore.....	5,938	152,559	101	298,683	12,240	17,143
		Total.....	467,719	23,538,956	1,815	7,094,133	272,526,228	201,620,188
Yukon.....	4	Lead ore.....	2,617	262,152	45	375,640	3,046,769	10,733
		Lead concentrates.....	2,729	960,217	193	1,640,075	2,865,030	.....
		Total.....	5,346	1,222,369	238	2,015,715	5,911,799	10,733
Canada.....	94		498,015	26,190,034	6,243	9,524,925	290,349,316	218,166,261
1927								
Quebec and Ontario.	2	Lead ores.....	.....	.....	.....	.....	.....	.....
		Lead concentrates.....	11,874	1,071,662	5,766	626,174	15,203,195	958,334
		Zinc concentrates.....	21,839	731,500	2,788	176,433	305,701	21,486,307
		Total.....	33,713	1,803,162	8,544	802,607	15,508,896	22,444,641
British Columbia....	110	Lead ore.....	66,692	1,515,119	6,367	1,402,756	25,366,010	10,581,238
		Lead concentrates.....	192,674	9,513,937	5,812	5,087,432	263,759,738	18,140,044
		Zinc ore.....	1,861	48,367	140	93,534	199,099	495,808
		Zinc concentrates.....	181,123	3,603,719	382	459,765	11,290,986	174,228,205
		Dry ore.....	10,637	79,278	1,101	83,410	323,730	473,061
		Total.....	452,987	14,760,420	13,802	7,126,897	300,936,563	203,918,356
Yukon.....	17	Lead ore.....	1,402	175,816	21	224,506	1,681,279	.....
		Lead concentrates.....	2,686	767,980	143	1,490,972	2,893,398	.....
		Dry ore.....	58	12,752	.....	19,691	72,676	.....
		Total.....	4,146	956,548	164	1,735,169	4,647,353	.....
Canada.....	129		490,846	17,520,130	22,510	9,664,673	321,092,812	226,362,997

Table 157.—Destination of Shipments from Silver-Lead-Zinc Mines in Canada, 1926 and 1927

Product shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assay			
			Gold	Silver	Lead	Zinc
		\$	Oz.	Oz.	Lb.	Lb.
1926						
<i>To Canadian Smelters—</i>						
Lead ore.....	64,689	2,645,744	1,253	1,835,269	31,826,280	10,682,022
Lead concentrates.....	174,848	13,167,106	292	4,185,244	232,065,912	18,656,605
Zinc ore.....	43,897	798,191	160	265,174	3,234,204	11,707,005
Zinc concentrates.....	158,530	6,303,530	2	468,833	11,577,126	143,180,008
Dry ore.....	5,936	152,546	99	298,630	12,044	16,737
Total.....	447,900	23,067,117	1,806	7,053,150	278,715,566	184,242,377
<i>To Foreign Smelters—</i>						
Lead ore.....	2,624	262,702	47	376,582	3,050,325	12,343
Lead concentrates.....	6,949	1,318,617	2,383	1,920,386	7,009,070	405,120
Zinc ore.....	8,610	184,167	5	9,665	244,734	2,426,594
Zinc concentrates.....	31,930	1,357,418	2,000	165,089	1,329,425	31,079,421
Dry ore.....	2	13	2	53	196	406
Total.....	50,115	3,122,917	4,437	2,471,775	11,633,750	33,923,884
1927						
<i>To Canadian Smelters—</i>						
Lead ore.....	66,639	1,513,804	6,362	1,398,643	25,352,408	10,581,238
Lead concentrates.....	195,255	9,728,897	1,007	4,979,854	270,377,177	18,140,044
Zinc ore.....	1,861	48,367	140	93,534	196,099	495,808
Zinc concentrates.....	178,713	3,559,187	382	459,765	11,290,986	171,865,106
Dry ore.....	10,623	78,248	1,100	80,488	321,543	473,061
Total.....	453,091	14,928,503	8,991	7,012,284	307,538,213	201,555,257
<i>To Foreign Smelters—</i>						
Lead ore.....	1,455	177,131	26	228,619	1,694,881	.....
Lead concentrates.....	11,979	1,624,682	10,704	2,224,724	11,479,154	958,334
Zinc ore.....	.....	.....	.....	.....	.....	.....
Zinc concentrates.....	24,249	776,032	2,788	176,443	305,701	23,849,406
Dry ore.....	72	13,782	1	22,613	74,863	.....
Total.....	37,755	2,591,627	13,519	2,652,389	13,554,599	24,807,740

Table 158.—Capital Employed in the Silver-Lead-Zinc Mining Industry in Canada, 1926 and 1927

Province	Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
1926				
Quebec.....	\$ 2,815,000	\$ 49,100	\$ 465,000	\$ 3,329,100
Ontario.....	1,498,002	82,814	43,900	1,624,716
British Columbia.....	11,082,253	641,789	3,843,832	15,567,874
Yukon.....	1,617,627	276,535	273,565	2,167,727
Canada.....	17,012,882	1,060,238	4,626,297	22,699,417
1927				
Nova Scotia and Quebec.....	2,953,469	74,192	873,979	3,901,640
Ontario.....	3,012,320	295,303	393,837	3,701,460
British Columbia.....	13,249,200	951,370	4,013,926	18,214,496
Yukon.....	1,370,100	691,609	157,025	2,218,734
Canada.....	20,585,089	2,012,474	5,438,767	28,036,330

Table 159.—Employees, Salaries and Wages in the Silver-Lead-Zinc Mining Industry in Canada, 1926 and 1927

Province	1926						1927					
	On salary	Mine		Mill	Total	Salaries and wages	On salary	Mine		Mill	Total	Salaries and wages
		Surface	Under-ground					Surface	Under-ground			
1926												
Quebec.....	13	95	112	25	245	\$ 300,878	21	146	151	30	348	\$ 348,904
Ontario.....	23	40	54	117	234	344,128	49	155	233	21	458	659,419
British Columbia.....	141	652	1,077	389	2,259	3,443,483	149	628	933	446	2,156	3,420,497
Yukon.....	20	68	86	12	186	343,241	10	45	78	11	144	378,997
Canada.....	197	855	1,329	543	2,924	4,431,730	229	974	1,395	508	3,106	4,807,817
1927												
Quebec.....	13	95	112	25	245	\$ 300,878	21	146	151	30	348	\$ 348,904
Ontario.....	23	40	54	117	234	344,128	49	155	233	21	458	659,419
British Columbia.....	141	652	1,077	389	2,259	3,443,483	149	628	933	446	2,156	3,420,497
Yukon.....	20	68	86	12	186	343,241	10	45	78	11	144	378,997
Canada.....	197	855	1,329	543	2,924	4,431,730	229	974	1,395	508	3,106	4,807,817

Table 160.—Wage-Earners in the Silver-Lead-Zinc Mining Industry in Canada, by Months, 1926 and 1927

Month	1926				1927			
	Surface	Under ground	Mill	Total	Surface	Under-ground	Mill	Total
January.....	561	11,98	419	2,178	619	1,184	433	2,236
February.....	566	1,169	373	2,108	668	1,216	413	2,297
March.....	601	1,104	410	2,115	766	1,279	420	2,465
April.....	610	1,103	418	2,131	848	1,282	434	2,564
May.....	730	1,081	530	2,341	821	1,289	466	2,576
June.....	802	1,148	559	2,509	905	1,309	498	2,712
July.....	813	1,192	577	2,582	983	1,347	525	2,855
August.....	815	1,243	590	2,648	1,011	1,366	527	2,904
September.....	898	1,246	605	2,749	1,020	1,361	554	2,935
October.....	912	1,236	603	2,751	1,100	1,375	562	3,037
November.....	740	1,199	547	2,486	1,008	1,341	500	2,849
December.....	629	1,169	514	2,312	783	1,308	439	2,530

Table 161.—Fuel and Electricity Used in the Silver-Lead-Zinc Mining Industry in Canada, by Provinces, 1926 and 1927

Kind	Unit	Quebec	Ontario	British Columbia	Yukon	Canada
1926						
Bituminous coal.....	Ton	734	751	19,471	20	20,976
	\$	6,973	7,063	102,849	2,850	119,735
Anthracite coal.....	Ton	30	34			64
	\$	506	558			1,064
Lignite coal.....	Ton			45		45
	\$			360		360
Coke.....	Ton		442	57		499
	\$		3,395	513		3,998
Gasoline.....	Imp. gal.		1,271	39,987	41,072	82,330
	\$		448	13,680	41,515	55,643
Oil (fuel).....	Imp. gal.	108		55,871	105,206	161,185
	\$	38		11,262	59,625	70,925
Wood.....	Cord	818		2,709	2,226	5,753
	\$	2,968		17,748	37,563	58,279
Other fuel.....	\$		24			24
Electricity*.....	K.W.H.	2,980,400	940,600	44,614,299	860,205	49,395,504
	\$	29,804	14,109	236,012	68,816	348,741
Total.....	\$	40,289	25,597	382,424	210,369	658,679
1927						
Bituminous coal (a) Canadian.....	Ton	60		27,812	16	27,888
	\$	510		142,468	1,898	144,876
(b) Imported.....	Ton	796	2,217			3,013
	\$	7,624	18,804			26,428
Anthracite coal.....	Ton		57			57
	\$		924			924
Coke.....	Ton	59	470	151	5	685
	\$	752	3,612	1,515	74	5,953
Gasoline.....	Imp. gal.	28,528	2,228	24,184	10,059	64,999
	\$	9,200	556	9,062	8,198	27,016
Kerosene and coal oil.....	Imp. gal.		323	4,089	500	4,912
	\$		78	960	418	1,456
Fuel oil and diesel oil.....	Imp. gal.		5,209	168,219	110,442	283,870
	\$		689	21,911	54,347	76,947
Wood.....	Cord	467	100	5,332	468	6,367
	\$	2,168	800	26,251	10,006	39,225
Electricity purchased.....	K.W.H.	3,290,100	2,037,900	33,660,849		38,988,849
	\$	32,901	27,444	205,350		265,695
Total.....	\$	53,155	52,907	407,517	74,941	588,520
Electricity generated* (a) For own use.....	K.W.H.			10,402,730	892,555	11,295,285
(b) For sale.....	K.W.H.			4,539,230		4,539,230
Income from sales in item (b).....	\$			78,782		78,782

*In 1926, the record shows only total electricity used.

Table 162.—Power Employed in the Silver-Lead-Zinc Mining Industry in Canada, by Provinces, 1926 and 1927

Description	—	Quebec	Ontario	British Columbia	Yukon	Canada
1926						
Steam engines and turbines.....	No. of units H.P.	2 120	3 150	13 1,125	1 100	19 1,495
Internal combustion engines.....	No. of units H.P.	1 6	1 3	26 959	7 413	35 1,381
Hydraulic turbines or water wheels.....	No. of units H.P.	..... .....	..... .....	29 2,865	..... .....	29 2,865
<i>Total primary power.....</i>	<i>No. of units H.P.</i>	<i>3 186</i>	<i>4 165</i>	<i>68 4,849</i>	<i>8 513</i>	<i>85 5,741</i>
Electric motors run by purchased power.....	No. of units H.P.	31 1,164	25 675	54 5,066	..... .....	110 6,905
Total power employed.....	No. of units H.P.	34 1,290	29 828	122 10,015	8 513	193 12,646
Electric motors run by primary power in same plant.....	No. of units H.P.	..... .....	1 5	14 387	20 213	35 605
<i>Total electric motors.....</i>	<i>No. of units H.P.</i>	<i>31 1,164</i>	<i>26 680</i>	<i>68 5,453</i>	<i>20 213</i>	<i>145 7,610</i>
Boilers.....	No. of units H.P.	4 270	2 120	16 1,715	3 129	25 2,234
1927*						
Steam engines and steam turbines.....	No. of units H.P.	2 120	4 175	25 7,755	1 100	32 8,150
Gasoline, gas and oil engines.....	No. of units H.P.	..... .....	2 78	28 1,503	3 345	33 1,926
Hydraulic turbines or water wheels.....	No. of units H.P.	..... .....	..... .....	25 2,924	..... .....	25 2,924
<i>Total primary power.....</i>	<i>No. of units H.P.</i>	<i>2 120</i>	<i>6 253</i>	<i>78 12,182</i>	<i>4 445</i>	<i>90 13,000</i>
Electric motors run by purchased power.....	No. of units H.P.	32 1,265	39 1,482	304 13,527	..... .....	375 16,274
Total power employed.....	No. of units H.P.	34 1,385	45 1,735	382 25,709	4 445	465 29,274
Electric motors run by primary power in same plant.....	No. of units H.P.	..... .....	4 190	28 1,008	20 213	52 1,411
<i>Total electric motors.....</i>	<i>No. of units H.P.</i>	<i>32 1,265</i>	<i>43 1,672</i>	<i>332 14,535</i>	<i>20 213</i>	<i>427 17,685</i>
Boilers.....	No. of units H.P.	6 385	..... .....	30 3,725	2 115	38 4,225

*In 1927 data for one plant in Nova Scotia is included with Quebec.

4.—Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

ARSENIC

Arsenic production from Canadian ores in 1927 amounted to 6,227,968 pounds including sales of white arsenic amounting to 4,894,547 pounds and the recoverable arsenic contained in export shipments of concentrates and residues, amounting to a further 1,333,421 pounds of white arsenic. The value of the total Canadian production was \$211,979 in 1927 as compared with \$146,811 for 5,074,677 pounds marketed in 1925. The average price of arsenic on the New York market in 1927 was 3·83 cents per pound as against 3·40 cents in 1926.

The greater part of the Canadian production of arsenic is obtained from the south Ontario smelters as a by-product from the treatment of ores mined in Cobalt district. A small amount is also contained in residues exported from these smelters. British Columbia's annual production of arsenic is contained in concentrates shipped from the Nickel Plate gold mine to the Tacoma smelter for further treatment. A small production of arsenic from the arsenical gold ores of Nova Scotia was reported for 1927.

Arsenic is used mainly in the manufacture of insecticides, for which the principal market is found in the cotton-growing areas of the southern United States where it is largely used in the control of the boll-weevil, an insect which is very destructive to the southern cotton crop. The glass and tanning industries also consume considerable quantities of white arsenic.

Imports into Canada, of white arsenic during the year amounted to 286,377 pounds having a value of \$11,833. Exports of white arsenic amounted to 3,856,600 pounds valued at \$124,823.

Table 163.—Production of Arsenic in Canada, 1885-1927

Year	White Arsenic		Year	Arsenic in Ore*		White Arsenic	
	Tons	Value		Tons	Value	Tons	Value
		\$			\$		\$
1885.....	440	17,600	1907.....	656	11,094	330	36,209
1886.....	120	5,460	1908.....	986	17,506	716	41,060
1887.....	30	1,200	1909.....	224	3,346	1,129	64,100
1888.....	30	1,200	1910.....	547	5,716	1,502	75,328
1889.....			1911.....			2,097	76,237
1890.....	25	1,500	1912.....			2,045	89,262
1891.....	20	1,000	1913.....			1,692	101,463
1892-3.....			1914.....			1,737	104,015
1894.....	7	420	1915.....			2,396	147,830
1895-8.....			1916.....			2,186	262,349
1899.....	57	4,872	1917.....	280	11,200	2,656	658,231
1900.....	303	22,725	1918.....	1,078	43,114	2,482	520,525
1901.....	695	41,676	1919.....	530	21,218	2,859	488,706
1902.....	800	48,000	1920.....	623	22,231	1,831	425,617
1903.....	257	15,420	1921.....			1,491	233,763
1904-5.....			1922.....	518	21,097	2,058	299,940
1906.....	201	14,058	1923.....	631	44,030	2,579	582,785
			1924.....	513	39,185	1,798	309,108
			1925.....	714	21,513	1,003	108,789
			1926.....	545	12,687	1,992	134,124
			1927.....	667	15,644	2,447	196,335
			Total.....	8,517	289,581	42,011	5,130,907

* Computed as As_2O_3 ; net value as reported by the operators.

Table 164.—Production, Exports and Imports of Arsenic, (As_2O_3), for Canada, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
PRODUCTION—						
From arsenical concentrates exported.. lb.	1,428,885	21,513	1,090,460	12,687	1,333,421	15,644
White arsenic..... lb.	2,005,252	108,789	3,984,217	134,124	4,894,547	196,335
Total..... lb.	3,434,137	130,302	5,074,677	146,811	6,227,968	211,979
EXPORTS—						
White arsenic in arsenical concentrates..... lb.	972,000	10,590				
Arsenic, n.o.p..... lb.	1,702,000	97,748	3,344,000	108,120	3,856,600	124,823
IMPORTS—						
White arsenic..... lb.	498,720	30,305	144,031	5,604	286,377	11,833
Sulphide of arsenic..... lb.	21,810	2,974	68,829	3,136	16,245	1,593
Arseniate of soda..... lb.	6,361	1,769	15,357	3,151	25,148	4,024

* Included in arsenic, n.o.p.

Table 165.—Monthly Average Prices of Arsenic, 1925-1927

(From *Engineering and Mining Journal*)

Month	New York, in cents per pound		
	1925	1926	1927
January.....	6-00	3-00	3-50
February.....	5-75	3-25	3-75
March.....	5-75	3-25	3-75
April.....	5-75	3-25	3-75
May.....	5-25	3-50	3-75
June.....	4-75	3-50	3-75
July.....	4-50	3-50	3-75
August.....	4-00	3-50	4-00
September.....	3-75	3-50	4-00
October.....	3-50	3-50	4-00
November.....	3-50	3-50	4-00
December.....	3-25	3-50	4-00
Average.....	4-65	3-40	3-83

Table 166—World Production of Arsenic Ore and White Arsenic
1922-1926, in metric tons.

(Compiled by L. M. Jones, of the Bureau of Mines) Washington, D.C., U.S.A.

Country and product	1922	1923	1924	1925	1926
Algeria:					
Arsenate of lead—					
Gross weight.....	160	2,270	9,335	6,750	3,665
Arsenic content.....	34	409	1,587	1,215	733
Australia:					
New South Wales—					
Ore and concentrates.....	1	11,677	4,487	3,400	21,796
White arsenic.....	296	367	328	301	202
Queensland—					
Ore.....	1	1	1	1,133	828
White arsenic.....	406	620	573		
South Australia—					
Ore—					
Gross weight.....			69	102	
Arsenic content.....			1	1	
Victoria—					
White arsenic.....	1	1,036	437	1	1
Western Australia—					
Ore ^{2,3}					
Gross weight.....	1,092				
Arsenic content.....	1				
Austria:					
Ore ^{3,4}					
Gross weight.....			560	89	
Arsenic content.....			40	15	
Arsenic content of gold ores.....	103	136	216	237	155
Belgium:					
White arsenic.....	1,008	1,380	1,850	1	1
Brazil:					
White arsenic.....	154	162	146	1	51
Canada:					
White arsenic.....	1,867	2,340	1,631	910	1,807
Arsenic content of ores and concentrates ^{2,3}	470	572	465	648	495
China:					
Ore ^{2,3}	549	413	472	395	1
White arsenic ^{2,3}	30	176	237	94	1
Chosen:					
Ore.....	56	26		1	
White arsenic.....	1	95		2,107	
Czechoslovakia:					
Ore—					
Gross weight.....	1	24	217	34	4
Arsenic content.....	1	1	1	1	1
France:					
Ore.....	4,465	10,022	14,029	28,990	49,900
White arsenic.....	266	815	802	1	1
Germany:					
Ore and concentrates ⁵ —					
Gross weight.....	8,750	10,273	10,818	6,626	3,930
Arsenic content.....	2,958	3,363	3,499	2,085	1,353
Great Britain:					
Ore.....	360	741	304	11	
White arsenic and arsenic soot.....	994	1,631	3,258	2,586	1,693

Table 166.---World Production of Arsenic Ore and White Arsenic, 1922-1926, in metric tons---Concluded

Country and product	1922	1923	1924	1925	1926
Greece:					
White arsenic.....	967	1,176	1,096	423	1,148
Italy:					
Ore—					
Gross weight.....	450	206	147	4	200
Arsenic content.....	81	46	33	1	35
Japan:					
Ore.....	2,295	⁶⁴ 245	7,416	¹	¹
White arsenic.....	1,922	4,287	3,703	3,485	1,035
Mexico:					
White arsenic.....	7272	1,402	2,551	7,507	6,458
Norway:					
Ore—					
Gross weight.....		577			
Arsenic content.....		149			
Peru:					
Ore.....	¹	232		¹	
Arsenic.....	¹	⁸ 115		⁹ 119	
Portugal:					
Ore.....	106	160	279	76	7
White arsenic.....	604	887	874	1,092	354
Rhodesia, Southern:					
Ore—					
Gross weight.....	451	774	533	170	49
Arsenic content.....	¹	¹	¹	¹	¹
Sweden:					
Ore—					
Gross weight.....			80	110	13,149
Arsenic content.....			19	21	2,478
Switzerland:					
Ore—					
Gross weight.....	10	100	¹	¹	¹
Arsenic content.....	¹	¹	¹	¹	¹
Turkey:					
Ore—					
Gross weight.....	¹⁰ 200	¹	¹	¹	¹
Arsenic content.....	¹	¹	¹	¹	¹
Union of South Africa:					
White arsenic.....	3	5	102	33	38
United States:					
White arsenic.....	9,096	12,946	13,111	11,174	10,709

¹Data not available.²Exclusive of output of Ottery Mine, for which data are not available.³Exports.⁴Exclusive of arsenical gold ores worked primarily for their gold and silver content.⁵Data relate to concentrates produced and ore sold without concentration.⁶Incomplete figures, output of principal mines only.⁷Figures of Mexican Government. The Penoles Co. reports 335 tons shipped.⁸Content of ore.⁹White arsenic exported by the Anglo-French Ticapampa Silver Mining Co. (Ltd.)¹⁰Year ended Oct. 31.¹¹Production reported, but figures not available for publication.

COBALT

Canada's cobalt production in 1927 showed improvement over the previous year, the output amounting to 880,590 pounds valued at \$1,764,534 as against 661,778 pounds valued at \$1,136,014 in 1926.

Production figures for Canada include the cobalt content of the various cobalt products sold by the south Ontario smelters and the cobalt content of the ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

During 1926 and 1927, Canada's production of cobalt decreased sharply in contrast to the totals for earlier years. This was due largely to new competition in the world's markets arising from the development of properties in Central Africa by the Union Minière du Haut Katanga. Cobalt from this source, computed in terms of the cobalt content of metal, oxides and salts marketed during the year amounted in 1927 to 784,000 pounds as compared with 672,000 pounds in 1926.

Since the discovery of the Cobalt camp in 1903, by far the greater part of the world's supply of cobalt has been derived from the treatment of ores mined in that area. Two companies, the

Coniagas Reduction Company of Thorold, Ontario, (closed down in 1926) and the Deloro Smelting and Refining Company, Limited, at Deloro, Ontario, developed processes for the recovery of cobalt from these ores. A brief outline of the process follows:—

Reduction of the ore in a blast furnace produces a speiss containing silver, cobalt, nickel, a small amount of iron and other metals. The speiss is roasted to free it from arsenic; then chloridized and leached with sulphuric acid to extract the copper, and cyanided to dissolve the silver. Silver in the cyanide solution is precipitated by means of aluminium dust. The "speiss residues" remaining are treated for the recovery of cobalt and nickel in the form of oxides. In some cases the speiss residues are exported.

Cobalt oxide is marketed either as black or gray oxide; the black oxide contains about 70 per cent cobalt metal and the gray, about 75 per cent cobalt metal. Gray oxide is made by giving the black oxide a slight roast in a reducing atmosphere in a reverberatory furnace. Cobalt salts of various kinds are also made, and if the pure metal is required, the black oxide is reduced in the reverberatory furnace using charcoal as the reducing agent.

The market for cobalt which was very poor in 1915 gradually improved during the war. No quotations on the New York market were available during 1918, 1919 and 1920. During 1921 the quotations given in the *Engineering and Mining Journal* ranged from \$3 to \$3.50 per pound; the former value was used in computing the annual production values. In 1922 the average price \$3.25 per pound, was used. In 1923, the quotation, \$2.85 was used, but from 1924 to date the values given in the report have been based on the returns actually received by the operators for the products sold. In 1927 the market quotations for cobalt were: metal, \$2.50 per pound; cobalt oxide, \$2.10 per pound.

Bounties.—Under the provisions of the *Metal Refining Bounty Act*, passed by the Ontario Legislature in 1907, bounties were paid to refineries amounting to \$126,987.08 on cobalt metal, cobalt oxide, and salts of cobalt, and \$43,153.85 on nickel oxide, and salts of nickel, or a total for both cobalt and nickel of \$170,140.93. The quantities produced and the bounties paid each year are given in detail in the annual *Reports of the Ontario Bureau of Mines*.

The bounty was at the rate of 6 cents per pound on the metallic content of the oxides. The Act which expired in April 1917, was not re-enacted.

An historical summary of the production in Canada which dates from the year 1904 is shown in the following table. For the years 1904 to 1910 inclusive, the figures given were prepared by the Ontario Bureau of Mines, and represent the estimated cobalt content of the ores shipped from the mines. From 1911 to date, the quantities given are the cobalt content of all smelter products sold or shipped, such as cobalt metal, the oxides, mixed oxides and residues, etc.

Table 167.—*Production of Cobalt from Canadian Ores, 1904-1927

Year	Pounds	Year	Pounds	Year	Pounds
1904.....	32,000	1913.....	865,937	1922.....	616,088
1905.....	236,000	1914.....	871,891	1923.....	760,105
1906.....	642,000	1915.....	504,212	1924.....	948,704
1907.....	1,478,000	1916.....	840,536	1925.....	1,116,492
1908.....	2,448,000	1917.....	1,079,572	1926.....	664,778
1909.....	3,066,000	1918.....	737,157	1927.....	880,590
1910.....	2,196,000	1919.....	530,371		
1911.....	1,704,000	1920.....	546,023		
1912.....	663,093	1921.....	251,986	Total.....	23,679,535

*See preceding paragraph.

Table 168.—Production in Canada and Exports of Cobalt, 1925-1927

	1925		1926		1927	
	Pounds	\$	Pounds	\$	Pounds	\$
PRODUCTION— Cobalt, computed as cobalt in metal, oxides and salts sold, and in ores and residues exported.....	1,116,492	2,328,517	664,778	1,136,014	880,590	1,764,534
EXPORTS— Cobalt alloys, cobalt metallies, cobalt oxides, cobalt salts and cobalt ores..	.....	1,867,607	.....	1,064,276	.....	1,678,468

Table 169.—Imports of Cobalt into the United States, 1919-1927

(From *The Mineral Industry*, 1927)

Year	Ore		Cobalt		Zaffer		Oxide	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$		\$
1919.....	17,045	2,832	60,511	141,450	.....	.....	131,424	184,751
1920.....	13,039	4,794	143,603	326,864	220	14	202,724	399,605
1921.....	7,657	3,235	38,442	105,539	.....	.....	164,003	342,426
1922.....	5,195	7,075	126,364	321,396	.....	.....	217,530	435,895
1923.....	58,719	56,326	225,639	552,434	.....	.....	258,594	511,903
1924.....	27,786	37,276	118,952	264,935	.....	.....	226,703	440,898
1925.....	34,782	31,320	198,669	422,185	.....	.....	287,265	525,803
1926.....	154,468	55,820	387,076	820,873	110	40	333,132	632,478
1927.....	60,382	3,019	407,198	841,412	.....	.....	369,747	703,608

SILVER

CANADA

Production—SPECIAL NOTE.—Prior to 1922, the method used in compiling the statistics on the silver production of Canada was to include, except for Ontario, the quantities of silver produced from Canadian ores either in Canadian or foreign smelters. For Ontario, the sales of silver bullion from the mines and smelters were considered as the year's production. In order to bring the practice for Ontario into harmony with that used in computing the silver output for the other provinces, adjustments amounting to 1,222,450 ounces were made for 1922 to take account of the stocks of silver bullion on hand at the end of 1921 which had not been previously included in the reports on the mineral production of Canada.

Production of silver from Canadian ores during 1927 amounted to 22,736,698 fine ounces which at the average price of 56·370 cents per ounce for the year, was valued at \$12,816,677 as against 22,371,924 fine ounces produced in 1926 and valued at \$13,894,531, when the average price was 62·107 cents per ounce.

A small quantity of silver was produced in association with gold in the provinces of Nova Scotia, Manitoba and Alberta. The Quebec output of 740,864 fine ounces was contained in silver-lead-zinc concentrates and copper concentrates which were exported for treatment in foreign smelters, and in blister copper made by the Noranda smelter which went into operation on December 16, 1927.

Ontario produced 9,307,953 fine ounces, 83 per cent of which was in the form of bullion; the remainder was contained in concentrates exported, in gold bullion produced by the gold mines, and in the nickel-copper ores of the Sudbury district.

British Columbia's output of 11,040,445 fine ounces was greater than in any other year on record. Small amounts were recovered with alluvial gold and from gold bullion, but the Sullivan mine and the Premier mine were responsible for the greater part of the output from this province. The Sullivan, primarily noted for its lead and zinc production, is the largest producer of silver in Canada. Silver was recovered from the copper ores and concentrates which were exported for treatment in foreign smelters and from blister copper made at the Trail and Granby Smelters.

Yukon production at 1,647,295 fine ounces consisted of 6,925 fine ounces from the crude alluvial gold, and 1,640,370 fine ounces contained in ores and concentrates exported from the Mayo district.

Table 170.—Production of Silver in Canada, by Provinces and by Sources, 1926 and 1927

	1926		1927	
	Quantity	Value	Quantity	Value
	Fine ounces	\$	Fine ounces	\$
NOVA SCOTIA—				
In gold bullion.....	112	70	125	70
QUEBEC—				
In gold ores, in blister copper and in copper and silver-lead-zinc ores exported.....	375,986	233,513	740,864	417,625
ONTARIO—				
In silver bullion and nuggets.....	7,877,629	4,892,559	8,108,026	4,570,494
In gold bullion.....	248,887	154,576	266,946	150,477
In slags exported from gold mines.....	444	276	5,077	2,862
In matte, blister copper and in silver ores, concentrates and residues exported.....	1,148,005	712,991	927,904	523,060
Total.....	9,274,965	5,760,402	9,307,953	5,246,893
MANITOBA—				
In gold bullion.....	18	11	12	7
ALBERTA—				
In gold bullion.....			4	3
BRITISH COLUMBIA—				
In alluvial gold.....	3,764	2,338	1,654	932
In gold bullion.....	17,179	10,669	2,452	1,382
In blister copper.....	1,235,398	767,269	964,747	543,828
In base bullion and in ores exported.....	9,369,475	5,819,100	10,071,592	5,677,357
Total.....	10,625,816	6,599,376	11,040,445	6,223,499
YUKON—				
In alluvial gold.....	5,702	3,541	6,925	3,904
In ores exported.....	2,089,325	1,297,618	1,640,370	924,676
Total.....	2,095,027	1,301,159	1,647,295	928,580
Canada.....	22,371,924	13,894,531	22,736,698	12,816,677

Table 170A.—Production of Silver in Canada, 1887-1927

Year	Fine ounces	Value	Cents per ounce	Year	Fine ounces	Value	Cents per ounce
		\$				\$	
1887.....	355,083	347,271	98-00	1909.....	27,529,473	14,178,504	51-50
1888.....	437,232	410,998	94-00	1910.....	32,869,204	17,580,455	53-49
1889.....	383,318	358,785	93-60	1911.....	32,559,044	17,355,272	53-30
1890.....	400,687	419,118	104-60	1912.....	31,955,560	19,440,165	60-83
1891.....	414,523	409,549	98-00	1913.....	31,845,803	19,040,924	59-79
1892.....	310,651	272,130	86-00	1914.....	28,449,821	15,593,631	54-81
1893.....	428,738	330,128	77-00	1915.....	26,625,960	13,228,842	49-68
1894.....	847,697	534,049	63-00	1916.....	25,459,741	16,717,121	65-66
1895.....	1,578,275	1,030,299	65-28	1917.....	22,221,274	18,091,895	81-417
1896.....	3,205,343	2,149,503	67-06	1918.....	21,383,979	20,693,704	96-772
1897.....	5,553,446	3,323,395	59-79	1919.....	16,020,557	17,802,474	111-122
1898.....	4,452,333	2,593,929	58-20	1920.....	13,330,357	13,450,330	100-900
1899.....	3,411,644	2,032,658	59-58	1921.....	13,543,198	8,485,355	62-654
1900.....	4,468,225	2,740,362	61-33	1922.....	18,626,439	12,576,758	67-521
1901.....	5,539,192	3,265,354	58-95	1923.....	15,601,744	12,067,509	64-873
1902.....	3,198,581	1,709,642	52-16	1924.....	19,736,323	13,180,113	66-781
1903.....	4,281,317	2,238,351	53-45	1925.....	20,228,988	13,971,150	69-065
1904.....	3,577,526	2,047,005	57-22	1926.....	22,371,924	13,894,531	62-107
1905.....	6,000,023	3,621,133	60-35	1927.....	22,736,698	12,816,677	56-370
1906.....	8,473,379	5,659,455	66-79				
1907.....	12,779,799	8,348,659	65-33	Total.....	538,314,492	345,693,512	.....
1908.....	22,106,233	11,686,239	52-86				

Table 171.—Production of Silver from Canadian Ores,* by Provinces, 1887-1927

Year	Quebec		Ontario		British Columbia		Yukon Territory	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$		\$
1887.....	146,898	143,666	190,495	186,304	17,690	17,301		
1888.....	149,388	140,425	208,064	195,580	79,780	74,993		
1889.....	148,517	139,012	181,609	169,986	53,192	49,787		
1890.....	171,545	179,436	158,715	166,066	70,427	73,066		
1891.....	185,584	183,357	225,633	222,926	3,306	3,266		
1892.....	191,910	168,113	41,581	36,425	77,160	67,592		
1893.....		126,439		8,989		195,000		
1894.....	101,318	63,830			746,379	470,219		
1895.....	81,753	53,369			1,496,522	976,930		
1896.....	70,000	46,942			3,135,343	2,102,561		
1897.....	80,475	48,116	5,000	2,990	5,472,971	3,272,289		
1898.....	74,932	43,655	85,000	49,521	4,292,401	2,500,753		
1899.....	40,231	23,970	202,000	120,352	2,939,413	1,751,302	230,000	137,034
1900.....	58,400	35,817	161,650	99,140	3,958,175	2,427,548	290,000	177,857
1901.....	41,459	24,440	151,400	89,250	5,151,333	3,036,711	195,000	114,953
1902.....	42,500	22,168	145,000	75,632	3,917,917	2,043,586	185,000	96,985
1903.....	28,600	15,287	17,777	9,502	2,996,204	1,601,471	156,000	83,362
1904.....	15,000	8,583	206,875	118,376	3,222,481	1,843,935	133,170	76,201
1905.....	19,620	11,841	2,451,356	1,479,442	3,439,417	2,075,757	89,630	54,093
1906.....	17,686	11,813	5,401,766	3,607,894	2,990,262	1,997,226	63,665	42,522
1907.....	16,000	10,452	9,982,363	6,521,178	2,745,448	1,793,519	35,988	23,510
1908.....	13,299	7,030	19,398,545	10,254,847	2,631,389	1,391,058	63,000	33,204
1909.....	13,233	6,815	24,822,099	12,784,126	2,649,141	1,364,387	45,000	23,176
1910.....	7,593	4,061	30,366,366	16,241,755	2,407,887	1,287,883	87,418	46,756
1911.....	18,435	9,827	30,540,754	16,279,443	1,887,147	1,005,924	112,768	60,078
1912.....	9,465	5,758	29,214,025	17,772,352	2,651,002	1,612,737	81,068	49,318
1913.....	34,573	20,672	28,411,261	16,987,377	3,312,343	1,980,483	87,626	52,392
1914.....	57,737	31,646	25,139,214	13,779,055	3,159,897	1,731,971	92,973	50,959
1915.....	63,450	31,524	22,748,609	11,302,419	3,565,852	1,771,658	248,049	123,241
1916.....	98,610	64,748	21,608,158	14,188,133	3,392,872	2,227,794	360,101	236,446
1917.....	136,194	110,885	19,301,835	15,714,975	2,655,994	2,162,430	119,605	97,379
1918.....	178,675	172,907	17,198,737	16,643,562	3,921,336	3,794,755	71,915	69,594
1919.....	140,926	156,600	12,117,878	13,465,628	3,713,537	4,126,556	27,556	30,621
1920.....	61,003	61,552	9,907,626	9,996,795	3,327,028	3,356,971	19,190	19,363
1921.....	38,084	23,861	9,761,607	6,116,037	3,350,357	2,099,133	393,092	246,288
1922.....			10,811,903	7,300,305	7,150,937	4,828,384	663,493	447,997
1923.....	33,006	21,412	10,540,943	6,838,226	6,113,327	3,965,899	1,914,438	1,241,953
1924.....	83,814	55,972	11,272,567	7,527,933	8,153,003	5,444,657	226,755	151,429
1925.....	214,943	148,451	10,529,131	7,271,944	8,579,458	5,925,403	904,893	624,964
1926.....	375,986	233,513	9,274,965	5,760,402	10,625,816	6,599,376	2,095,027	1,301,159
1927.....	740,864	417,625	9,207,953	5,246,893	11,040,445	6,223,499	1,647,295	928,580
Total.....	4,001,706	3,085,590	382,090,460	244,631,460	141,094,589	91,276,370	10,640,555	6,641,514

*Does not include small productions from Nova Scotia, New Brunswick, Alberta and Manitoba.

ONTARIO

Table 172.—Silver Shipments by Areas, in Ontario, 1904-1927

From 1926 Report of Ontario Department of Mines.

Year	Silver shipments in Troy ounces						Average price, cents per ounce (New York)
	Cobalt area	Cásey township	South Lorrain	Gowganda	Montreal River and Maple Mountain	Total	
1904.....	206,875					206,875	57-221
1905.....	2,451,356					2,451,356	60-352
1906.....	5,401,766					5,401,766	66-791
1907.....	10,023,311					10,023,311	65-237
1908.....	19,424,251	500	13,124			19,437,875	52-884
1909.....	25,658,683	26,185	194,955		18,002	25,897,825	51-502
1910.....	29,849,981	92,544	221,133	471,688	9,835	30,645,181	53-486
1911.....	29,989,893	114,789	933,912	468,687	510	31,507,791	53-340
1912.....	28,605,940	253,824	834,119	549,976		30,243,859	60-835
1913.....	28,105,505	825,108	248,992	502,370		29,681,975	57-791
1914.....	24,155,699	499,643	108,199	399,300		25,162,841	54-811
1915.....	24,280,366	223,939		242,229		24,746,534	49-684
1916.....	19,008,517	445,900	77,280	383,393		19,915,090	65-661
1917.....	18,327,258		10,000	1,064,635		19,401,893	81-417
1918.....	16,807,407	143,901	72,188	638,198		17,661,694	96-772
1919.....	10,314,689	171,278	4,586	723,764		11,214,317	111-122
1920.....	10,402,249		8,253	433,352	2,467*	10,846,321	100-900
1921.....	7,673,535	1,101	328,886	258,292	117	8,261,931	62-654
1922.....	9,239,147	1,028	1,284,307	170,651	15,994†	10,711,127	67-528
1923.....	7,259,858		2,955,646	160,761	1,581	10,377,846	64-873
1924.....	6,704,787		2,633,058	598,057		9,935,902	66-781
1925.....	6,252,115		3,099,964	1,355,156		10,707,235	69-065
1926.....	6,262,249		3,044,584	1,236,640		10,543,473	62-107
1927.....	4,482,543		2,319,356	1,741,614		8,543,513	56-370
Total.....	350,887,980	2,799,740	18,392,542	11,398,763	48,506	383,527,531	

* Includes 885 oz. from Silver Islet, Lake Superior.

† Silver Islet, exclusively.

Table 173.—Percentage of Ontario's Silver Production Credited to Each Producing Group, 1918-1927

Group	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
	%	%	%	%	%	%	%	%	%	%
Cobalt district.....	55-0	48-7	58-6	51-8	74-4	60-8	51-2	(a) 60-1	31-5	22-0
Ontario smelters.....	29-0	36-4	33-7	41-1	19-3	30-5	39-4	26-7	(b) 56-2	(b) 70-1
Total production in Ontario....	84-0	85-1	92-3	92-9	93-7	91-3	90-6	86-8	87-7	92-1
Production in foreign smelters...	16-0	14-9	7-7	7-1	6-3	8-7	9-4	13-2	12-3	7-9
Total.....	100-0	100-0	100-0	100-0	100-0	100-0	100-0	100-0	100-0	100-0

(a) Includes a small amount of silver from gold ores exported.

(b) Includes silver in gold bullion produced by gold mines, in nuggets sold for exhibition purposes and in products of the nickel refineries.

MANITOBA

Silver production in Manitoba during the year amounted to only a few ounces recovered from crude gold shipped to the Mint. Copper deposits were developed during the war, and from 1918 to 1920 shipments of copper ore containing silver were sent to Trail; in those three years, production from this source amounted to about 50,000 ounces. Owing to the drop in price of copper and to the high freight rates, practically no shipments of copper ores have been made in recent years. Recent developments in this province indicate that a resumption of production may be looked for at an early date. Copper-gold and copper-zinc properties are being opened up; the ore from these will likely yield some silver also.

Table 174.—Production of Silver in Manitoba, 1919-1927

Year	Fine ounces	Value
		\$
1919.....	20,700	23,069
1920.....	15,510	15,649
1921.....	33	20
1922.....	20	14
1923.....	5	3
1924.....	140	93
1925.....	477	329
1926.....	18	11
1927.....	12	7

BRITISH COLUMBIA

Table 175.—Production of Silver in British Columbia by Districts, 1926 and 1927

(From *Annual Report of the Minister of Mines for British Columbia.*)

District and division	1926		1927	
	Ounces	Value	Ounces	Value
		\$		\$
Northwestern District (No. 1)—				
Atlin.....	26,583	16,510	5,307	2,992
Stikine.....				
Liard.....				
Nass River.....	409,470	254,310	298,152	168,068
Portland Canal.....	3,092,503	1,920,661	3,302,244	1,861,475
Skeena.....	6,927	4,302	12	7
Queen Charlotte.....				
Bella Coola.....				
Northeastern District (No. 2)—				
Cariboo.....			36	20
Quesnel.....				
Omineca.....	239,053	148,469	173,072	97,561
Peace River.....				
Central District (No. 3)				
Nicola.....	1,060	658		
Vernon.....	51	32	1,605	905
Yale.....	16	10		
Ashcroft.....				
Kamloops.....	133,815	83,108	85,070	47,954
Lillooet.....	807	501	1,098	619
Clinton.....				
Southern District (No. 4)—				
Grand Forks.....	16	10	491	277
Greenwood.....	408,562	253,745	520,814	293,583
Osoyoos.....	11,353	7,051	111	62
Similkameen.....	141,236	87,717	137,971	77,774
Eastern District (No. 5)				
Fort Steele.....	4,942,364	3,069,554	5,123,925	2,888,357
Windermere.....	20,356	12,643	2,583	1,456
Golden.....			264	149
Ainsworth.....	139,832	86,845	120,908	68,156
Slocan.....	938,880	583,110	402,065	226,644
Slocan City.....	1,136	705	81,334	17,663
Nelson.....	52,152	32,390	76,726	43,250
Arrow Lake.....				
Trail Creek.....	24,705	15,344	16,868	9,508
Revelstoke.....	143	89	2,025	1,142
Trout Lake.....			274	154
Lardeau.....	9,314	5,785	1,863	1,050
Western District (No. 6)—				
Nanaimo.....			6	3
Alberni.....				
Clayoquot.....				
Quatsino.....				
Victoria.....				
New Westminster.....	109	68		
Vancouver.....	148,113	91,989	165,361	93,214
Total.....	10,748,556	6,675,606	10,470,185	5,902,043

Table 176.—Imports into Canada and Exports of Silver, 1925-1927

	1925		1926		1927	
	Fine ounces	\$	Fine ounces	\$	Fine ounces	\$
IMPORTS—						
Silver bullion in bars.....		1,025,109		1,011,015		896,535
Silver, manufactures of, n.o.p.		210,384		371,565		344,021
Silver coin.....		61		55		410
Total.....		1,235,554		1,382,635		1,240,966
EXPORTS—						
Silver contained in ore, concentrates, etc.....	4,754,915	3,021,418	5,890,280	3,546,952	5,445,117	2,894,386
Silver bullion.....	14,316,797	9,861,219	15,241,853	9,559,825	15,970,961	8,995,040
Silver coin.....		2,089				
Total.....	19,071,712	12,884,726	21,132,133	13,106,777	21,416,078	11,889,426

Prices.—In 1926 silver provided students of the mineral industry with much food for thought. Disturbances in the Orient, the world's principal market for silver, had an unsettling effect on prices. In China, internal trading was disturbed by the influence of the insurgent element in the population; the necessity for silver for the settlement of foreign trade balances declined with the reduction in trade; the lack of demand in China was reflected in the Indian bazaars; and then came the announcement of the findings of the Royal Commission appointed to inquire into the Indian currency situation. This report was improperly understood at first to mean the abolition of silver as currency in India. As a result of these disturbing factors, the price of silver broke in September and declined still further in the following months to reach 51½ cents in New York in December, a lower level than had been recorded at any time in more than ten years. The average price of silver for the year was 62·107 cents per fine ounce.

The following excerpt from *Engineering and Mining Journal** may be of interest:

In 1927 it was evident that the Indian government intended to carry out the recommendations of the Royal Commission to reduce the amount of silver it held in reserve. A sale of a fairly large amount was reported to have been made late in July, and this report was undoubtedly the largest factor in depressing the price from an average of 56·36 cents in New York for July to 54·72 cents for August. The market advanced from that low point to an average of 58·12 cents for the week ending December 14. The average price of silver for the year was 56·370 cents per fine ounce.

Table 177.—Monthly Average Prices of Silver, 1925-1927

From the *Engineering and Mining Journal*

Month	New York (Cents per fine ounce)			London (Pence per standard ounce)		
	1925	1926	1927	1925	1926	1927
January.....	68·447	67·795	55·795	32·197	31·322	25·863
February.....	68·472	66·773	57·898	32·245	30·797	26·854
March.....	67·808	65·880	55·306	31·935	30·299	25·655
April.....	66·899	64·409	56·399	31·372	29·682	26·136
May.....	67·580	65·075	56·280	31·276	30·125	26·072
June.....	69·106	65·481	56·769	31·863	30·248	26·203
July.....	69·442	64·793	56·360	31·954	29·861	25·983
August.....	70·240	62·380	54·718	32·268	28·773	25·224
September.....	71·570	60·580	55·445	32·983	27·904	25·565
October.....	71·106	54·505	56·035	32·972	25·291	25·776
November.....	69·223	54·141	57·474	32·155	25·192	26·526
December.....	68·889	53·466	57·957	31·835	24·733	26·701
Average.....	69·065	62·107	56·370	32·088	28·686	26·047

World Production.—In order of importance, the chief silver-producing countries of the world are: Mexico, United States, Canada and Peru. This places Canada third in the countries of the world and first in the British Empire.

(*Engineering and Mining Journal, January 21, 1928.)

The North American continent produced 186.6 million ounces in 1927 out of a total world's production of 254.6 million ounces. South America was credited with 27.3 million ounces, Europe, 11.8 million ounces, of which 6 millions were produced in Germany (including Silesia), and 2.8 million ounces, in Spain and Portugal. Oceania was credited with 11.5 million ounces, and the continent of Asia with 13.1 million ounces, whilst Africa, the greatest gold-producing continent of the world, produced only 1.2 million ounces of silver.

Table 178.—World Production of Silver 1913 and 1923-1927

(Fine ounces)

From Year Book of the American Bureau of Metal Statistics, 1922 and 1927

	1913	1923	1924	1925	1926	1927
NORTH AMERICA—						
United States.....	66,801,500	66,163,338	64,221,655	61,377,977	60,918,000	59,412,000
Canada.....	31,524,708	18,601,744	19,736,323	20,228,988	22,371,924	22,613,134
Mexico.....	55,486,431	90,810,855	91,437,944	92,912,000	98,291,000	104,575,000
Total North America.....	153,812,639	175,575,937	175,395,922	174,518,965	181,580,924	186,600,134
Total—Central America and West Indies..	2,135,641	3,000,000	2,700,000	2,700,935	3,499,118	3,000,000
SOUTH AMERICA—						
Argentina.....	35,271		20,000	18,000	15,000	*15,000
Bolivia.....	3,932,594	5,212,843	4,857,608	5,174,000	5,839,000	5,407,000
Brazil.....	28,564	28,613	28,613	1,833	20,672	*20,000
Chile.....	Included	3,337,474	3,033,225	3,261,682	2,876,911	3,000,000
Colombia.....	with Bolivia	3,150	2,900	2,900	2,800	*3,000
Ecuador.....	32,842	75,000	70,000	70,000	80,000	*80,000
Peru.....	9,617,094	18,654,362	18,717,087	20,746,909	21,100,000	18,800,000
Other countries.....	51,111	11,200	11,400	11,715	11,215	*12,000
Total South America.....	14,274,759	27,322,642	26,740,833	29,287,039	29,945,598	27,337,000
EUROPE—						
Austria-Hungary.....	2,104,107	14,178	28,678	23,920	14,050	*15,000
France.....	1,005,266	213,025	147,858	352,010	401,875	*400,000
Czecho Slovakia.....	702,317	732,538	707,300	707,300	765,491	*750,000
Great Britain.....	128,543	34,625	31,153	32,439	41,345	*40,000
Germany (including Silesia).....	6,182,445	3,883,945	4,787,521	5,291,890	5,629,140	6,040,700
Greece.....	803,750	195,000	160,750	254,274	254,300	*250,000
Italy.....	423,888	385,806	496,975	320,761	519,371	550,000
Norway.....	300,602	298,995	424,330	504,755	308,640	*300,000
Rumania.....		64,300	72,209	76,581	15,400	*15,000
Russia.....		192,900	250,000	250,000	400,000	*400,000
Serbia.....	28,758					
Jugo-slavia.....		24,562	31,250	26,106	45,010	*50,000
Spain and Portugal.....	4,237,239	2,842,060	2,879,965	3,303,863	3,000,656	2,800,000
Sweden.....	33,339	15,046				
Turkey.....	1,509,133	8,037	219,906	219,900	225,050	*200,000
Total Europe.....	16,757,070	8,874,796	10,263,183	11,363,799	11,620,328	11,810,700
OCEANIA—						
New South Wales.....	14,504,889	12,067,954	9,256,671	9,220,160	9,709,741	
Queensland.....	604,979	469,302	276,651	385,489	252,540	
Victoria.....	16,195	6,304	4,216	2,082	2,373	
New Zealand.....	975,616	527,491	500,023	494,482	424,751	
Tasmania.....	765,187	638,602	642,158	730,194	766,653	
Other states.....	190,680	109,048	90,163	82,684	68,766	
Total Oceania.....	17,057,546	13,818,701	10,769,882	10,915,091	11,224,824	11,500,000
ASIA—						
India.....	125,209	4,863,066	5,309,203	4,854,923	5,124,962	6,030,000
China.....		100,000	110,000	110,000	135,000	*190,000
Chosen (Korea).....	15,048	39,281	54,662	70,299	51,927	*50,000
Dutch East Indies.....	465,980	1,408,973	2,083,256	2,385,016	2,363,829	*2,400,000
Japan.....	4,700,390	3,597,264	3,542,255	4,059,340	4,479,366	4,550,000
Other countries.....	51,763	23,437	11,008	13,162	14,314	*15,000
Total Asia.....	5,358,390	10,032,021	11,110,384	11,492,740	12,169,398	13,145,000
AFRICA—						
Algeria.....				96,450	100,887	100,000
Belgian Congo.....	1,454	8,745				
Rhodesia.....	121,537	161,492	401,277	157,971	153,990	131,598
Transvaal, Cape Colony and Natal.....	952,928	1,373,930	1,396,943	1,161,470	981,333	1,012,035
Other countries.....		1,000	733	2,727	2,386	2,500
Total Africa.....	1,075,919	1,545,167	1,798,953	1,418,618	1,238,596	1,246,133
Grand Total.....	210,471,964	240,169,264	238,779,157	241,697,187	251,278,786	254,638,967

(a) The basis of this table is the information published by the Director of the Mint. However, revisions and additions have been made so that the totals do not agree with the Mint figures. For 1927 the figures are based on actual reports or reliable estimates, except where the asterisk is used indicating that the figure is conjectural.

LEAD

CANADA

Production of lead from Canadian ores in 1927 established a new record in quantity when the total recovery amounted to 311,423,161 pounds worth \$16,477,139 as against 283,801,265 pounds valued at \$19,240,661 in 1926.

Canada's lead production includes (a) lead contained in ores exported less deductions for smelter losses valued at the average price in London for the year; (b) the lead contained in the base bullion made by the Consolidated Mining and Smelting Co., Ltd., valued at the average price in London for the year, and (c) the pig lead made by the Kingdon Mining, Smelting and Manufacturing Co. at Galetta, Ontario, at its sales value.

Production in 1927 included 292,770,544 pounds of lead from British Columbia, the greater part of which was from the Sullivan mine, situated at Kimberley, on the Crowsnest line of the Canadian Pacific Railway; 7,990,709 pounds from Ontario which included a small amount contained in silver-lead-bismuth bullion exported from the Deloro smelter; but the greater part was in the form of pig lead produced at the Kingdon mine on Chats Island in the Ottawa river, about 1½ miles north of Galetta village and about 40 miles from Ottawa; 6,496,577 pounds contained in concentrates exported to Belgium from the Tetreault mine at Notre Dame des Anges, Portneuf county, Quebec; and 4,165,331 pounds contained in ores and concentrates exported to United States smelters from the mines of the Mayo district, Yukon Territory; the largest mine in this latter group was the Tredwell-Yukon.

Previous to 1904, lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces to a base bullion which was then exported for refining. A lead refinery employing the Betts electrolytic process has been in operation at Tadanac (near Trail), B.C., since 1904, treating the product from lead blast furnaces.

Refined lead produced in Canada which includes the product of the lead refinery at Trail and the pig lead made at Galetta amounted to 295,766,327 pounds in 1927 as against 257,273,585 pounds in 1926.

Table 179.—Production of Lead in Canada, 1926 and 1927

Province	1926		1927	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	3,729,636	251,788	6,496,577	341,461
Ontario.....	7,398,795	580,730	7,990,709	528,729
British Columbia.....	266,812,461	18,012,509	292,770,544	15,388,020
Yukon.....	5,860,373	395,634	4,165,331	218,929
Total.....	283,801,265	19,240,661	311,423,161	16,477,139

Table 180.—Production* of Lead from Canadian Ores, 1887-1927

Year	Pounds	Value	Cents per pound	Year	Pounds	Value	Cents per Pound
1887.....	204,800	\$ 9,216	5-400	1907.....	47,738,703	2,542,086	5-325
1888.....	674,500	29,812	4-420	1908.....	43,195,733	1,814,221	4-200
1889.....	165,100	6,488	3-930	1909.....	45,857,424	1,692,139	3-690
1890.....	105,000	4,704	4-480	1910.....	32,987,508	1,216,249	3-687
1891.....	88,665	3,857	4-350	1911.....	23,784,969	827,717	3-480
1892.....	808,420	33,064	4-090	1912.....	35,763,476	1,597,554	4-467
1893.....	2,135,023	79,636	3-730	1913.....	37,662,703	1,754,705	4-659
1894.....	5,703,222	187,636	3-290	1914.....	36,337,765	1,627,568	4-479
1895.....	16,461,794	531,716	3-230	1915.....	46,316,450	2,593,721	5-600
1896.....	24,199,977	721,159	2-980	1916.....	41,497,615	3,532,692	8-513
1897.....	39,018,219	1,396,853	3-580	1917.....	32,576,281	3,628,020	11-137
1898.....	31,915,319	1,206,399	3-780	1918.....	51,398,002	4,754,315	9-250
1899.....	21,862,436	977,250	4-470	1919.....	43,827,699	3,053,037	6-966
1900.....	63,169,821	2,760,521	4-370	1920.....	35,953,717	3,214,262	8-940
1901.....	51,900,958	2,249,387	4-334	1921.....	66,679,592	3,828,742	5-742
1902.....	22,956,381	934,095	4-069	1922.....	93,307,171	5,817,702	6-235
1903.....	18,139,283	768,562	4-237	1923.....	111,234,466	7,985,522	7-179
1904.....	37,531,244	1,617,221	4-309	1924.....	175,485,499	14,221,345	8-104
1905.....	56,864,915	2,676,632	4-707	1925.....	253,590,578	23,127,460	9-120
1906.....	54,608,217	3,089,187	5-657	1926.....	283,801,265	19,240,661	6-751
				1927.....	311,423,161	16,477,139	5-256
				Total.....	2,298,933,071	143,530,252	.....

*Previous to 1913 the figures reported show the metal content of the shipments and are somewhat in excess of the actual amount recovered. Since 1912 the data given represent the quantity of lead produced in Canada from domestic ores, together with the estimated lead recovery from lead ores and concentrates exported. From 1887 to 1908, average prices at New York; 1909 and 1910, average prices at Toronto; from 1911 to 1925, average prices in Montreal were used in making up the values shown. In 1926 and 1927 the average yearly price at London was used.

Table 181.—Production of Lead from Canadian Ores, by Provinces, 1887-1927

Year	Quebec		Ontario		British Columbia		Yukon	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
1887.....					204,800	9,216		
1888.....					674,500	29,812		
1889.....					165,100	6,488		
1890.....	105,000	4,704						
1891.....	88,665	3,857						
1892.....					808,420	33,064		
1893.....	3,931	146			2,131,092	79,490		
1894.....					5,703,222	187,636		
1895.....					16,461,794	531,716		
1896.....					24,199,977	721,159		
1897.....	177,084	6,340			38,841,135	1,390,513		
1898.....	221,760	8,382			31,693,559	1,198,017		
1899.....					21,862,436	977,250		
1900.....	11,200	490			63,158,621	2,760,031		
1901.....	318,052	13,784			51,582,906	2,235,603		
1902.....	420,000	17,090			22,536,381	917,005		
1903.....			50,000	2,119	18,089,283	766,443		
1904.....			885,000	38,135	36,646,244	1,579,086		
1905.....			284,212	13,378	56,580,703	2,663,254		
1906.....			2,200,000	124,454	52,408,217	2,964,733		
1907.....					47,738,703	2,542,086		
1908.....					43,195,733	1,814,221		
1909.....					45,857,424	1,692,139		
1910.....					32,987,508	1,216,249		
1911.....					23,784,969	827,717		
1912.....					35,763,476	1,597,554		
1913.....			33,000	1,537	37,662,703	1,754,705		
1914.....					36,289,845	1,625,422	2,804	131
1915.....	40,401	2,262	88,985	4,983	45,377,064	2,541,116	810,000	45,360
1916.....	698,760	59,485	685,932	58,393	39,157,701	3,333,496	955,222	81,313
1917.....	1,378,001	153,468	1,586,711	176,712	29,483,725	3,283,602	127,844	14,238
1918.....	2,110,059	195,180	1,684,366	155,804	47,594,328	4,402,475	9,249	856
1919.....	2,280,000	158,825	1,487,586	103,625	40,060,113	2,790,587		
1920.....	595,482	80,949	2,255,520	201,643	32,792,725	2,931,670		
1921.....	595,881	34,215	3,312,493	190,203	60,298,603	3,462,346	2,472,615	141,978
1922.....			2,890,397	180,216	67,093,266	5,430,265	3,323,508	207,221
1923.....	520,041	37,334	4,401,494	315,983	99,541,818	7,146,107	6,771,113	486,098
1924.....	1,058,983	85,820	5,055,368	409,687	168,467,628	13,652,617	903,520	73,221
1925.....	2,051,100	187,060	7,209,534	657,510	242,454,502	22,111,850	1,875,442	171,040
1926.....	3,729,636	251,788	7,398,795	580,730	266,812,461	18,012,509	5,860,373	395,634
1927.....	6,496,577	341,461	7,990,709	528,729	292,770,544	15,388,020	4,165,331	218,929
Total.....	23,210,603	1,642,610	49,500,102	3,743,841	2,198,897,425	136,605,602	27,324,941	1,838,170

Table 182.—Refined Lead Produced in Canada,* 1904-1927

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1904.....	7,519,440	1913.....	37,923,043	1922.....	81,412,716
1905.....	15,804,509	1914.....	36,443,706	1923.....	101,096,312
1906.....	20,471,314	1915.....	43,518,618	1924.....	130,471,208
1907.....	26,607,461	1916.....	33,087,474	1925.....	213,217,605
1908.....	36,549,274	1917.....	32,115,114	1926.....	257,273,585
1909.....	41,833,614	1918.....	31,571,112	1927.....	265,766,327
1910.....	32,987,508	1919.....	34,330,920		
1911.....	23,525,050	1920.....	28,720,030	Total.....	1,659,138,923
1912.....	35,893,190	1921.....	60,949,793		

* Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galetta, Ont.

QUEBEC

Lead production at 6,496,577 pounds in the province of Quebec was greater in 1927 than in any other year on record. During 1922 there was no production from Quebec mines but in the next year shipping was resumed and through a system of selective flotation worked out by the Mines Branch, Ottawa, good lead and zinc concentrates were made and production increased year by year. Considerable interest has been displayed in the Gaspé peninsula as a possible producer of lead and zinc ore. The Federal Zinc and Lead Company have done a considerable amount of development work in this district. Other companies interested in Gaspé are the Pioneer Mining Corporation, Limited; the Huronian Belt Limited; the British Metals; and Messrs. Lyall and Beidelman. Lead has also been found associated with zinc in the copper-gold ores of the Rouyn district of western Quebec.

ONTARIO

Many years ago, two lead mines were operated in Frontenac county but it was not until 1913 that any statistical records were kept. During that year the Kingdon mine, Carleton county, on which some work was done as far back as 1884 and 1885, was re-opened and some 33,000 pounds of lead were recovered. The vein has been followed to a depth of over 1,100 feet and in the underground workings for a horizontal distance of over 2,500 feet. A very efficient mill is in operation and in 1927 the production of lead amounted to 7,984,776 pounds which constituted a record for this property. At the lower levels zinc also occurs. A zinc concentrate is made and stored until a sufficient supply in on hand to make an export shipment.

Small quantities of lead are recovered from the silver-lead-bismuth bullion exported by the smelter operating on ores of the Cobalt district. In 1927 the recovery amounted to 5,933 pounds.

BRITISH COLUMBIA

British Columbia is by far the largest lead-producing province in the Dominion and in the Sullivan mine has the largest lead and zinc mine in the world. There are other silver-lead-zinc mines as well which are situated in the Fort Steel and Slocan-Ainsworth districts, and numerous other fields supply ore. The properties in the southern section of the province practically all ship to the smelter at Trail while the newer properties in the northern part of the province ship to foreign smelters.

During 1927 production of lead in British Columbia amounted to 292,770,544 pounds, the largest ever recorded. This figure includes the lead in base bullion made at Trail, and the recoverable lead in ores exported. Production in 1926 amounted to 266,812,461 pounds.

YUKON

Production of lead from the Mayo district of the Yukon amounted to 4,165,331 pounds in 1927 as against an output in 1926 of 5,860,373 pounds. The principal producer in this district is the Treadwell Yukon which company operates a mill and buys ore from small operators in the district. Some small operators ship high-grade ore directly to smelters in the United States.

IMPORTS AND EXPORTS

Imports into Canada in 1927 of litharge, acetate and nitrate of lead, shots and bullets, dry white lead, white lead ground in oil and dry red lead and orange mineral, and other manufactures were greater than in 1926 while decreases were noted in old and scrap lead, pig lead, bars and sheets, pipe lead and tea lead. The net increase in the value of these imports over 1926 was \$125,171. Exports of lead in ore showed a slight decrease in quantity while exports of pig lead amounted to 239,409,100 pounds, an increase of 36,898,800 pounds over the corresponding export figures for the previous year. The chief market for Canada's pig lead is in Europe and the Orient.

Table 183.—Imports into Canada and Exports of Lead, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	\$	Pounds	\$	Pounds	\$
IMPORTS—						
Old and scrap, pig and block.....	505,555	50,606	766,939	67,671	405,127	33,165
Bars and sheets.....	104,814	10,554	116,846	11,887	112,039	8,906
Litharge.....	1,515,300	159,576	2,229,600	223,839	3,015,000	245,630
Acetate and nitrate of lead.....	222,535	20,516	140,046	13,492	337,044	28,218
Other manufactures.....	-	237,717	-	263,398	-	344,053
Pipe lead.....	42,592	4,099	116,344	11,011	109,296	8,456
Shots and bullets.....	6,040	923	12,316	1,543	14,129	1,514
Tea lead.....	131,402	16,260	83,531	10,362	59,808	5,936
Lead pigments—						
Dry white lead.....	47,549	4,749	60,606	5,539	338,399	24,879
White lead, ground in oil.....	127,016	14,795	73,468	7,539	360,301	28,252
Dry red lead and orange mineral....	628,648	68,509	1,153,873	112,915	1,844,288	125,358
Total.....	-	588,304	-	729,196	-	854,367
EXPORTS—						
Lead in ore.....	37,504,500	2,341,679	13,644,900	796,412	13,032,600	844,637
Pig lead.....	160,130,800	11,809,305	202,510,300	12,983,907	239,409,100	11,981,388
Total.....	197,635,300	14,150,984	216,155,200	13,780,319	252,441,700	12,826,025

PRICES

Lead prices in London during 1927 were highest in March when the average was £27·845 sterling per long ton. This was a slight increase over the January and February averages. The price then receded each month until a low point of £20·479 was reached in October. A slight improvement was shown in November which became more marked in December when the average price was £22·163.

The average price for the year in Montreal was 6·73 cents per pound, in New York, 6·755 cents per pound, and in London, £24·192 sterling per long ton, this latter price being equal to 6·751 cents per pound in Canadian funds computed at par (£ = 4·8666).

Table 184.—Monthly Average Prices of Pig Lead, Montreal,* New York and London,† 1925-1927

Month	Montreal (Value in cents per pound)			New York (Value in cents per pound)			London‡ (Value in pounds sterling per long ton)		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
January.....	10-04	9-07	7-52	10-169	9-255	7-577	41-443	34-778	27-485
February.....	9-56	8-02	7-48	9-428	9-154	7-420	37-944	33-903	27-344
March.....	9-29	8-54	7-62	8-914	8-386	7-577	36-804	31-625	27-845
April.....	8-29	7-79	7-22	8-005	7-971	7-126	32-791	28-775	26-546
May.....	8-14	7-53	6-82	7-985	7-751	6-616	32-283	28-253	25-054
June.....	8-46	7-81	6-65	8-321	8-033	6-414	33-470	29-986	24-438
July.....	8-74	8-07	6-45	8-151	8-499	6-344	34-698	31-716	23-491
August.....	9-40	8-30	6-40	9-192	8-908	6-681	38-188	32-756	23-119
September.....	9-53	8-23	6-07	9-508	8-786	6-297	38-884	32-085	21-446
October.....	9-55	8-00	5-87	9-513	8-402	6-250	39-017	30-821	20-479
November.....	9-40	7-82	6-06	9-739	8-005	6-259	36-872	29-270	20-889
December.....	9-02	7-77	6-43	9-310	7-855	6-504	34-739	28-932	22-163
Average.....	9-12	8-15	6-73	9-020	8-417	6-755	36-429	31-075	24-192

*Producers' prices for car load quantities ex-cars Montreal, as furnished by the Consolidated Mining and Smelting Company.

†From the *Engineering and Mining Journal*.

‡Computed at par (\$4-8666), the London price of lead in 1925 was 7-914 cents per pound; in 1926 was 6-751 cents per pound; and in 1927 was 5-256 cents per pound.

Table 185.—World Production of Lead, 1913 and 1923-1927

(From the *Year Book of the American Bureau of Metal Statistics* 1922 and 1927).

(Short tons)

Country	1913	1923	1924	1925	1926	1927
NORTH AMERICA—						
United States.....	435,665	530,000	590,000	662,500	696,000	673,000
Canada (a).....	18,822	53,899	86,583	126,994	141,886	155,845
Mexico.....	68,324	184,242	177,697	205,159	220,879	274,025
Total North America.....	522,811	768,141	854,280	994,653	1,058,265	1,102,870
SOUTH AMERICA—						
Argentina.....		4,000	5,000	8,488	9,370	8,598
Other South America.....	2,729	1,600	7,900	4,700	10,100	7,500
Total South America.....	2,729	5,600	12,900	13,188	19,470	16,098
EUROPE—						
Austria.....	26,558	4,690	5,494	5,961	7,141	8,913
Belgium.....	59,056	56,328	64,286	72,278	63,080	72,203
France.....	31,766	19,194	20,811	22,641	21,495	27,447
Germany (including Upper Silesia) (b).....	207,176	35,163	55,335	77,712	84,034	90,168
Great Britain.....	20,304	7,512	5,938	5,303	4,777	6,769
Greece.....	20,177	4,667	5,628	5,914	5,622	5,291
Italy.....	23,885	18,885	24,318	26,979	26,003	26,279
Czecho-Slovakia and Jugo-Slavia.....		12,909	15,158	14,330	13,276	14,403
Poland (excluding Upper Silesia).....	2,976					
Russia.....	1,678		709	1,067	1,479	2,039
Spain.....	219,110	140,569	147,708	152,335	162,470	153,278
Sweden.....	1,361	338	740	901	621	864
Upper Silesia.....		18,796	22,130	30,146	30,648	31,839
Total Europe.....	614,037	319,041	368,255	415,570	425,646	438,983
ASIA—						
Turkey.....	15,318	1,543	5,626	5,276	6,629	8,655
India (Burma).....	6,535	51,239	57,969	52,945	60,849	73,883
Japan.....	4,162	2,976	3,242	3,678	4,409	4,409
Total Asia.....	26,015	55,758	66,837	61,899	71,887	86,947
Australia.....	126,207	137,364	140,645	165,634	170,412	184,710
AFRICA—						
Rhodesia.....		12,343	7,003	3,674	4,292	6,561
Tunis.....		15,754	17,345	15,070	20,262	20,272
Total Africa.....		28,097	24,348	18,744	24,554	26,833
Grand Total.....	1,291,799	1,314,001	1,467,265	1,669,688	1,770,234	1,856,441

(a) Dominion Bureau of Statistics reports the Canadian production of lead as follows: 1913—18,831 tons: 1923—55,617 tons: 1924—87,743 tons: 1925—126,795 tons: 1926—141,900 tons: 1927—155,712 tons.

(b) Including Upper Silesia in 1913.

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ZINC

Production of zinc from Canadian ores in 1927 established a new high record for this metal with a total of 165,495,525 pounds (82,748 tons) which valued at the average London price for the year of 6.194 cents per pound, was worth \$10,250,793. The 1926 output amounted to 149,938,105 pounds (74,969 tons) which valued at the average London price of 7.41 cents per pound was computed to be worth \$11,110,413.

Refined zinc is produced at Trail, B.C., from the silver-lead-zinc ores of the West Kootenay district and from the Sullivan mine at Kimberley, B.C. Zinc concentrates are exported to Belgium, and France from the Tetreault silver-lead-zinc property in Quebec. No other provinces in Canada produced zinc in 1927 but development work on a zinc property was carried on in the Sudbury district near Chelmsford, Ontario, by the Treadwell Mining Company.

Figures for the Canadian total production of zinc are made up by adding the production of refined zinc at Trail to the amount of zinc estimated as recoverable from ores exported; the value of production is calculated at the monthly average price for zinc on the London market for the year, exchange conversion being made at par. Previous to 1926, the average price on the St. Louis market was used, but as the bulk of Canada's zinc output is exported and sold on the basis of London quotations, it was thought that a more accurate aggregate value would be obtained by using prices quoted in London, and in 1926 this change in practice was made. It may be noted that the present procedure is in conformity with the practice of the British Columbia Department of Mines.

Table 186.—Production of Zinc in Canada, 1926 and 1927

Province	1926		1927	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	12,904,176	956,199	17,189,046	1,064,690
British Columbia.....	137,033,929	10,154,214	148,306,479	9,186,103
Total.....	149,938,105	11,110,413	165,495,525	10,250,793

Table 187.—Production of Zinc from Canadian Ores, 1898-1927

Year	Quantity	Value	Year	Quantity	Value
		\$			\$
(From 1898 to 1904, quantities show pounds of zinc contained in ores or concentrates shipped from the mines)			1914.....	10,893	262,563
1898 (a).....	788,000	36,011	1915.....	14,895	554,938
1899.....	814,000	46,805			
1900.....	212,800	9,342	(From 1916 to date, quantities show pounds of zinc recovered by Canadian smelters, and estimated recoveries by foreign smelters)		
1901.....			1916.....	23,364,760	2,991,623
1902.....	142,200	6,882	1917.....	29,668,764	2,640,817
1903.....	900,000	48,600	1918.....	35,083,175	2,862,436
1904.....	477,568	24,350	1919.....	32,194,707	2,362,448
(From 1905 to 1915 quantities show tons of ore or concentrates shipped from the mines)			1920.....	39,863,912	3,057,961
1905.....	9,413	139,200	1921.....	53,089,356	2,471,310
1906.....	1,154	23,800	1922.....	56,290,000	3,217,536
1907.....	1,573	49,100	1923.....	60,416,240	3,991,701
1908.....	452	3,215	1924.....	98,909,077	6,274,791
1909 (b).....	18,371	242,699	1925.....	109,268,511	8,328,446
1910.....	5,063	120,003	1926.....	149,938,105	11,110,413
1911.....	2,590	101,072	1927.....	165,495,525	10,250,793
1912.....	6,415	211,774			
1913.....	7,899	186,827	Total.....		61,627,456

(a) No Mines Branch records of production prior to 1898.

(b) Includes 7,424 tons shipped late in 1908.

Table 188.—Production of Zinc from Canadian Ores, by Provinces, 1898-1927

Year	Quebec		Ontario		Alberta		British Columbia	
	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$
From 1898 to 1904, quantities show pounds of zinc contained in ores or concentrates shipped from the mines)								
1898 (a).....	788,000	36,011						
1899.....			814,000	46,805				
1900.....	22,400	983	190,400	8,359				
1901.....								
1902.....			142,200	6,882				
1903.....			900,000	48,600				
1904.....			477,568	24,350				
(From 1905 to 1915 quantities show tons of ore or concentrates shipped from the mines)								
1905.....							9,413	139,200
1906.....			500	6,700			654	17,100
1907.....			217	3,000			1,356	46,100
1908.....			452	3,215				
1909.....			895	8,950			(b)	17,476
1910.....			576	5,760				233,749
1911.....							4,487	114,243
1912.....			10	375			2,590	101,072
1913.....	335	6,700					6,405	211,399
1914.....	969	10,017					7,554	180,127
1915.....	300	16,500					9,924	252,546
							14,595	538,438
(From 1916 to date, quantities show pounds of zinc recovered by Canadian smelters and estimated recoveries by foreign Smelters.)								
1916.....	1,663,200	212,956					21,701,560	2,778,667
1917.....	1,786,740	159,038			20,583	1,832	27,861,441	2,479,947
1918.....	2,802,928	228,691					32,280,247	2,633,745
1919.....	1,752,000	128,562	147,692	10,838			30,295,015	2,223,048
1920.....	1,120,200	85,931	13,950	1,070			38,729,762	2,970,960
1921.....							53,089,356	2,471,310
1922.....							56,290,000	3,217,536
1923.....	366,240	24,197					60,050,000	3,967,504
1924.....	2,909,008	184,547					96,000,069	6,090,244
1925.....	9,936,000	757,322	179,545	13,685			99,152,966	7,557,439
1926.....	12,904,176	956,199					137,033,929	10,154,214
1927.....	17,189,046	1,064,690					148,306,479	9,186,103
Total.....		3,872,344		188,589		1,832		57,564,691

(a) No *Mines Branch* records of production prior to 1898.

(b) Includes 7,424 tons shipped late in 1908.

Table 189.—Production of Refined Zinc at Trail, B.C., 1916-1927

Year	Short tons	Year	Short tons
1916.....	2,974	1922.....	28,145
1917.....	9,985	1923.....	30,025
1918.....	12,574	1924.....	27,444
1919.....	12,326	1925.....	38,462
1920.....	18,517		
		1926.....	61,727
1921.....	26,494	1927.....	73,208

IMPORTS AND EXPORTS.

In 1927 the imports of zinc and zinc products into Canada reached a total value of \$2,112,690, an increase of more than \$222,000 over the year 1926. Imports of brass and brass products were also greater than in either of the two preceding years.

Exports of zinc ore were less in 1927 than in 1926 or in 1925 owing to the increase made in the capacity of the Sullivan concentrator while as a result of the enlargement of the Trail smelter, exports of spelter increased from 24,913 tons in 1925 to 56,210 tons in 1927. Exports of brass manufactures and old scrap, amounted in value to \$1,349,012 in 1927 as against \$853,755 in 1926 and \$1,124,974 in 1925.

Table 190.—Imports into Canada and Exports of Zinc and Brass, 1925-1927

	1925		1926		1927	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
IMPORTS						
Zinc and Zinc Products—						
Zinc, in blocks, pigs and sheets.....	4,322,335	407,236	5,797,282	582,784	5,911,727	512,389
Zinc, as spelter.....	1,265,510	100,736	1,122,640	86,779	1,355,816	89,233
Zinc white (80% Zn.).....	13,301,222	923,755	13,278,306	943,724	16,665,713	1,113,573
Zinc dust (90% Zn.).....	315,440	28,664	435,440	46,800	339,055	34,110
Zinc, sulphate and chloride of (44% Zn.)	1,070,595	47,450	1,650,725	73,604	2,032,015	86,149
Zinc, manufactures of.....		178,230		156,637		277,236
Total.....		1,686,071		1,890,328		2,112,690
Brass and Brass Products—						
Brass, in blocks, pigs and ingots (30% Zn.)	263,000	30,461	432,300	51,971	819,500	99,956
Brass, old and scrap (30% Zn.).....	3,604,900	344,303	2,669,500	265,637	2,908,500	270,627
Brass, tubing (30% Zn.).....	1,966,480	485,961	2,726,066	672,435	2,765,078	627,124
Brass, plain wire (30% Zn.).....	366,032	87,724	487,881	126,360	453,239	113,668
Brass, bars and rods.....	685,300	131,182	1,077,300	190,436	652,300	114,270
Brass, strips, sheets or plates.....	948,400	155,089	1,424,700	264,193	784,700	158,742
Brass, wire cloth, n.o.p.....		125,752		102,112		48,030
Brass, cup for manufacture of shells.....		106,373		115,141		96,773
Brass, caps for electric batteries.....		16,522		17,094		16,373
Brass, hand-pumps.....		15,739		20,567		25,479
Brass, nails, tacks, etc.....		4,503		1,777		3,057
Brass and copper rivets, burrs and washers.....		45,334		49,006		85,576
Brass valves.....		206,540		254,855		307,753
Brass, other manufactures, n.o.p.....		2,194,641		2,656,189		3,089,060
Carburetors of brass.....		252,521		146,248		39,444
Tubing, brass or copper, not more than ½-inch in diameter, in lengths not less than 6 feet, coated with metal, and not polished, bent or otherwise manufactured.....			883	205	5,335	1,173
Total.....		4,202,645		4,934,224		5,097,105
EXPORTS						
Zinc—	Tons		Tons		Tons	
Ore.....	48,340	1,778,019	41,917	1,393,165	25,227	862,498
Spelter.....	24,913	3,781,011	48,004	7,107,876	56,210	6,826,808
Total.....		5,559,030		8,501,041		7,689,306
Brass—	Pounds		Pounds		Pounds	
Old and scrap.....	9,819,600	838,908	6,071,400	536,889	7,296,400	584,725
Rods, sheets and tubing.....	49,400	10,663	59,900	13,089	47,300	10,054
Valves.....		160,727		161,899		248,385
Mfrs. of brass, n.o.p.....		114,676		141,878		505,848
Total.....		1,124,974		853,755		1,349,012

PRICES

The average price of zinc on the London market in 1927 was £28·513 per long ton which, converted at par, corresponded to 6·194 cents per pound in Canadian funds. This was the unit price used in 1926 and 1927 when computing the value of Canada's zinc production. St. Louis prices were used for some years in computing the value of Canada's zinc production but since the greater part of this country's output is sold in European and Oriental countries on the basis of London quotations, it was thought that a more accurate measure of the actual return to the producer would be obtained by using the London quotations.

Table 191.—Monthly Average Prices of Zinc at Montreal, St. Louis and London, 1925-1927

Month	Montreal ¹ (In cents per pound)			St. Louis ² (In cents per pound)			London ² (In pounds Sterling per long ton)		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
January.....	9-22	9-80	8-18	7-738	8-304	6-661	37-917	38-059	30-979
February.....	8-93	9-31	8-17	7-480	7-759	6-673	36-528	36-053	29-931
March.....	8-75	8-82	8-16	7-319	7-332	6-692	35-741	34-090	30-649
April.....	8-44	8-49	7-80	6-985	7-001	6-338	34-644	32-503	29-579
May.....	8-40	8-31	7-53	6-951	6-821	6-075	34-223	32-038	29-034
June.....	8-45	8-58	7-68	6-990	7-112	6-213	34-149	33-244	28-598
July.....	8-65	8-87	7-66	7-206	7-411	6-229	34-894	34-045	28-280
August.....	9-01	8-85	7-80	7-576	7-376	6-342	36-691	34-173	28-210
September.....	9-18	8-89	7-67	7-753	7-413	6-212	37-435	34-389	27-347
October.....	9-71	8-76	7-46	8-282	7-296	5-996	39-884	34-256	26-899
November.....	10-10	8-70	7-20	8-614	7-199	5-745	39-039	33-491	26-281
December.....	9-91	8-51	7-18	8-565	7-018	5-722	38-327	32-915	26-363
Average.....	9-06	8-83	7-71	7-622	7-337	6-242	36-624	34-105	28-513

¹Supplied by Consolidated Mining and Smelting Co., Montreal, P.Q.²From the *Engineering and Mining Journal*.

Converted at par, the average London quotations in cents per pound were: In 1925=7-956 cents; in 1926=7-410 cents; and in 1927 were 6-194 cents.

Table 192.—*World Production of Zinc, 1913 and 1923-1927

(From the *Year Book of the American Bureau of Metal Statistics* 1927)

(Short tons)

Country	1913	1923	1924	1925	1926	1927
United States.....	352,952	531,202	535,846	590,928	638,533	613,548
Mexico.....				1,406	6,550	7,089
Canada.....		30,025	27,443	38,481	61,727	73,528
Belgium.....	225,050	162,082	178,242	188,339	209,074	222,686
Czechoslovakia.....		2,418	7,603	8,307	3,527	4,079
France.....	74,815	54,381	63,614	74,693	80,969	91,105
Germany (Silesia excluded).....	(a) 307,238	35,467	45,745	64,620	75,361	92,706
Upper Silesia.....		92,425	85,615	108,192	117,103	143,112
Great Britain.....	73,000	35,033	43,098	42,726	20,148	46,893
Italy.....		4,060	6,569	7,141	8,417	8,148
Austria-Hungary.....	23,921					
Jugoslavia.....		2,146	2,343	2,460	2,619	3,511
Netherlands.....	26,804	18,126	20,051	23,277	27,333	28,955
Norway.....	10,234	4,170	5,538	7,503	5,907	6,614
Poland (Upper Silesia excluded).....	8,398	13,546	16,999	17,846	19,290	22,643
Soviet Union.....			661	1,653	2,059	2,568
Spain.....	3,650	12,039	14,084	16,069	17,739	18,346
Sweden.....	2,204	1,420	3,881	5,233	5,291	5,071
Australia.....	4,614	46,091	52,205	51,280	52,942	54,438
Japan.....	992	15,190	15,508	18,684	18,739	18,739
French Indo-China.....			143	1,276	1,102	1,291
Total.....	1,113,872	1,059,821	1,125,188	1,265,714	1,375,030	1,465,070

(*) Slab zinc produced in the several countries, unallocated according to the origin of the ore.

(a) Including Upper Silesia in 1913.

CHAPTER FIVE

THE NICKEL-COPPER INDUSTRY IN CANADA

Including Commodity Statistics Tables on NICKEL, COPPER, and METALS of the PLATINUM GROUP

1. General Review.
2. Commodity statistics including tables showing production, by provinces, imports, exports, prices and world output of nickel, copper and metals of the Platinum group.

1. General Review

(a) *Definition of the Industry.*—The nickel-copper industry in Canada includes the mining, smelting, and to a certain extent, the refining of the nickel-copper ores of the Sudbury district in the province of Ontario. Smelting operations are carried on in close proximity to the mines, and refining is done at Port Colborne in Ontario by one of the companies, while the other exports matte for treatment in its refinery at Clydach, Wales.

As thus defined, the industry takes in the Canadian sources of nickel, metals of the platinum group, and one of the principal sources of copper.

Another industry, the copper-gold-silver mining group also produces a large part of the Dominion output of copper, but as the ores of this group, in the aggregate, usually carry about one-tenth of the gold produced each year from Canadian mines, the activities of the copper-gold mines are reviewed in the chapter on the gold mining industry. Production and trade statistics on nickel, copper and the metals of the platinum group are given in this chapter.

(b) *Historical.*—Construction of railways in Canada has lead in several instances to the discovery of valuable mineral deposits as for example, the finding of the nickel-copper ore bodies in the Sudbury area when the Canadian Pacific Railway was being built in 1883. The first of these was worked in 1886 primarily for copper, the presence of nickel not being detected until 1887. About this time the use of nickel in the manufacture of nickel steel was introduced and the resulting demand for nickel made possible the successful development of the great industry that has now become firmly established. Nickel steel was made in large quantities for armament purposes, and nickel production reached its peak during the great war. After hostilities ceased, the demand for nickel was considerably reduced and the nickel industry was depressed. Then, through intensive research, new uses for nickel were found so that now, production is once again gradually approaching the peak output figure won during the great war.

Smelting of the nickel-copper ore, containing on the average about 6 per cent combined nickel and copper, produces a matte containing about 80 per cent metal, of which about 52 per cent is nickel and the 28 per cent, is copper. Little variation has been observed in the ratio of nickel to copper in the matte made over a period of years, but recently there has been a perceptible increase in the percentage of copper in the ore as it comes from the mines.

It has been the practice of the company refining nickel in Canada to produce blister copper for export; the other company ships matte to its own refinery in Wales. The blister copper exported from Ontario is subsequently refined, and marketed as metal; the copper in matte exported to Wales is recovered in the form of copper sulphate, and sold as an insecticide for use in the vineyards of southern Europe.

(c) *Importance of Nickel, Copper and Platinum Group Metals.*—About 90 per cent of the world's supply of nickel is derived from Canadian ores, the remainder being obtained in New Caledonia and Norway. A small amount of nickel is found in the silver-cobalt ores of the Cobalt district, but most of the tonnage is produced from the ores of the Sudbury area.

Copper produced from the nickel-copper ores in Ontario constitutes about 35 per cent of the total copper obtained from all Canadian ores. British Columbia, mining and smelting copper ores and copper-gold ores, produces more than 60 per cent of Canada's copper output. Quebec supplies the remainder.

As a world producer of copper, Canada ranks fourth, contributing about 4 per cent of the world's output annually. The amount of refined copper produced in Canada is relatively small as, usually, it has been found more profitable not to refine in Canada but to ship blister copper or copper in matte or in concentrates, to smelters in other countries where the demand for refined copper is greater than in Canada. Improvement in Canadian demand for the refined metal may be expected as a phase of the industrial expansion now being observed, and the output of refined copper from Canadian plants, ought to increase proportionately, unless other untoward features of the market arise to check this progress.

Some gold and silver as well as metals of the platinum group, including, besides platinum, the related metals, palladium, rhodium, osmium and iridium, are present in varying amounts in the different ores of the Sudbury district. Some of these ores are richer than others in precious metals, and the recovery of platinum group metals, therefore, has been a feature of the work done by one of the great nickel companies, while the other company has found it profitable to enter this field only comparatively recently when the improved grade of ore being mined was found sufficiently rich to make the additional work worth while.

At the present time, Canada produces about 6 per cent of the world's supply of platinum, but recovery of much of this metal is carried out in refineries operating outside the confines of the Dominion.

Interest in the development work carried on by the two large companies operating nickel-copper properties in the Sudbury area increased during 1927. The International Nickel Company of Canada, Limited, continued to operate the Creighton mine and the smelter at Coppercliff and to produce refined and electrolytic nickel, nickel oxides and salts, and blister or converter copper in the refinery at Port Colborne, Ontario. Development of the Frood mine added greatly to the company's reserves. The Mond Nickel Company Limited, operating the Garson, Frood Extension, Worthington and Levack mines and the smelter at Coniston, Ontario, worked steadily throughout the year producing matte for shipment to the company's refinery at Clydach, Wales, and utilized the bessemer gases for the manufacture of high-grade sulphuric acid for which a splendid market has been established. Low production costs enable the company to make very favourable contracts with large users of acid. The collapse of the Worthington mine late in the year put an end to operations on this property. Fortunately, due to the care exercised by the operating staff at the mine, no lives were lost when the mine caved in. The loss of the Worthington mine which has been worked for about 20 years, while serious, was not so important as it would have been before the Frood ore body was proven. Work on this mine is being carried forward rapidly.

(d) *Mining*.—The ore in the Sudbury district averages from 2 to 4 per cent of nickel and from 1 to 3 per cent of copper, and is a mixture of the sulphides of copper, nickel and iron in the form of pyrrhotite and chalcopyrite associated with norite, a basic intrusive rock. Open-pit methods of mining were first used, but later, underground workings were adopted. Shafts are sunk and haulage ways are driven into a solid foot wall, the ore being intersected at intervals by cross cuts. The ore is usually hoisted to rock houses where it is crushed and hand-sorted; the high-grade material is suitable for direct smelting. Ore from the Frood mine cannot be hand-sorted satisfactorily because the precious metals are finely disseminated through the vein-bearing rock, so that crushing and concentration of the product from the mine are necessary before smelting can be undertaken with satisfactory results.

(e) *Smelting and Refining*.—Practice in the preparation of the ore for smelting varies. The International Nickel Company heap-roasts the coarse ore before smelting, and the Mond Nickel Company roasts only the fines and flue dust on Dwight-Lloyd sintering machines. Both companies smelt in water-jacketed furnaces, producing a slag which is sent to the dump, and a matte which contains 15 to 25 per cent of copper-nickel in addition to sulphur. This low-grade matte is transferred to a basic converter where practically all of the iron and part of the sulphur are eliminated. The product of these converters, bessemer matte, contains about 80 per cent copper-nickel; 19.5 per cent sulphur; 0.5 per cent iron; this product is shipped to the refineries for further treatment.

The International Nickel Company ships some matte to the Port Colborne refinery, where the products are converter copper, containing any gold and silver, electrolytic nickel, refined nickel and nickel oxide; and residues containing palladium and platinum. This company exports the remainder of the matte produced at the smelter to Huntington, West Virginia, U.S.A., for manufacture into monel metal, an alloy of copper and nickel in which the constituents are present in about the same proportions in which they occur in the ore and are not separated during refining process.

The Mond Nickel Company ships the smelter matte to the company's refinery at Clydach, Wales, for reduction. The refinery produces nickel metal of very high purity that finds many uses in the metallurgical field, and copper sulphate, mostly for use as an insecticide. Much of the nickel from the Mond plant near Clydach, Wales, is shipped to plants in other countries, notably the United States, for use in the manufacture of nickel alloys.

A considerable market has been built up for these alloys because of their resistance to corrosion. Chemical works, creameries, and other plants of a similar nature, are gradually increasing their uses for nickel and its alloys.

(f) *General Statistics.*—During the year 1927 there were 1,305,917 tons of ore raised and shipped either to the concentrators or direct to the smelters, the metallic content being about 27,500 tons of copper and 43,500 tons of nickel. In the same year smelters received 1,305,917 tons of ore and smelted 1,350,214 tons, producing 81,848 tons of matte containing 39,623 tons of nickel and 25,968 tons of copper. Smelter matte shipped to Canadian refineries during the year amounted to 39,942 tons; shipments to United States and British refineries totalled 33,541 tons.

In the nickel-copper mining, smelting and refining industry the capital employed amounted to \$69,436,704 including the cost of lands, buildings, plant, machinery and tools, supplies and products on hand, and cash, trading and operating accounts at the different mines, smelters and refineries.

Salaried employees numbered 173 persons, and salaries totalled \$544,167. Of 3,347 wage-earners, 1,590 worked in and about the mines and 1,757 in the smelters and refinery; wages for the year totalled \$4,919,446.

Fuel and electricity cost \$2,354,007 of which \$325,535 was expended for electric power; \$1,185,365 for coke; \$600,487 for bituminous coal; \$197,509 for fuel oil; and the remainder was spent for other fuels, such as anthracite coal, gasoline, wood and gas.

Power employed consisted of 728 units having a total rating of 55,838 h.p. Of these, 18 units rated at 4,708 h.p. were steam engines and oil engines, and the remaining 710 units with a rating of 51,130 h.p., were electric motors. Twelve boilers had a total rated capacity of 5,200 h.p.

Table 193.—Capital Employed in the Nickel-Copper Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings, plant, machinery and tools—		
Mines.....	38,202,370	38,893,815
Smelters and refinery.....	17,991,365	17,954,652
Cost of materials and supplies on hand.....	6,156,721	6,789,455
Cash, trading and operating accounts and bills receivable.....	5,664,893	5,798,782
Total.....	68,015,349	69,436,704

Table 194.—Output from Nickel-Copper Mines and Smelters in Canada, 1926 and 1927

		1926	1927
Ore mined.....	tons	1,322,050	1,305,917
Ore shipped.....	tons	1,322,050	1,305,917
Content of ores, etc., shipped:—			
Copper.....	lb.	55,096,719	55,128,978
Nickel.....	lb.	90,110,865	87,147,139
Ores, concentrates treated at smelters.....	tons	1,309,782	1,350,214
Matte produced.....	tons	78,643	81,848
Content of matte:—			
Copper.....	lb.	48,318,735	51,937,215
Nickel.....	lb.	78,076,003	79,246,144
Matte shipped to Canadian refineries.....	tons	34,042	39,942
Matte exported to Foreign smelters.....	tons	34,908	33,541

Table 195.—Proportion of Nickel and Copper in Sudbury Matte, 1912-1927

Year	Percentage		
	Nickel	Copper	Total
1912.....	53.5	26.3	79.8
1913.....	52.7	27.4	80.1
1914.....	49.0	31.1	80.1
1915.....	50.3	29.0	79.3
1916.....	51.6	28.0	79.6
1917.....	50.6	26.9	77.5
1918.....	52.6	26.0	78.6
1919.....	51.6	28.3	79.9
1920.....	52.7	27.6	80.3
1921.....	49.4	32.4	81.8
1922.....	50.1	31.3	81.4
1923.....	53.4	27.2	80.6
1924.....	52.6	27.9	80.5
1925.....	52.1	27.9	80.0
1926.....	49.6	30.6	80.2
1927.....	48.4	31.7	80.1

Table 196.—Employees, Salaries and Wages, in the Nickel-Copper Industry in Canada, 1926 and 1927.

	1926				1927			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
Salaried employees—				\$				\$
Mine and mill.....	21		21	65,625	27		27	85,048
Smelters and refinery.....	124	15	139	429,288	132	14	146	459,119
Total.....	145	15	160	494,913	159	14	173	544,167
Wage-earners—								
Mines and mill.....	1,416		1,416	1,897,992	1,590		1,590	2,401,265
Smelters and refinery.....	1,715		1,715	2,461,073	1,756	1	1,757	2,518,181
Total.....	3,131		3,131	4,359,065	3,346	1	3,347	4,919,446
Grand total.....	3,276	15	3,291	4,853,978	3,505	15	3,520	5,463,613

Table 197.—Employees by Months in the Nickel-Copper Industry in Canada, 1926 and 1927

Month	Mine		Mill	Smelters	Refinery	Total
	Surface	Under-ground				
1926						
January.....	276	904	180	1,277	604	3,241
February.....	260	926	178	1,266	540	3,170
March.....	261	932	153	1,227	578	3,151
April.....	255	893	179	1,187	606	3,120
May.....	268	907	175	1,191	317	2,858
June.....	276	940	172	1,171	289	2,848
July.....	309	919	177	1,182	515	3,102
August.....	337	927	179	1,214	533	3,190
September.....	354	950	179	1,235	505	3,223
October.....	363	967	179	1,233	513	3,255
November.....	353	990	180	1,256	450	3,229
December.....	332	994	180	1,257	428	3,191
1927						
January.....	296	1,007	110	1,377	500	3,290
February.....	301	1,049	146	1,378	556	3,430
March.....	309	1,164	179	1,261	533	3,446
April.....	332	1,138	177	1,210	536	3,393
May.....	307	1,172	175	1,184	427	3,265
June.....	337	1,144	158	1,191	522	3,352
July.....	335	1,134	150	1,188	517	3,324
August.....	323	1,133	179	1,241	507	3,383
September.....	314	1,148	172	1,272	509	3,415
October.....	368	1,093	118	1,242	501	3,322
November.....	351	1,091	118	1,232	505	3,297
December.....	330	1,104	125	1,232	459	3,250

Table 198.—Fuel and Electricity Used in the Nickel-Copper Industry in Canada, 1926 and 1927

	Unit	1926			1927		
		Mines	Smelters and refinery	Total	Mines	Smelters and refinery	Total
Bituminous coal—							
Canadian.....	Ton						
Imported.....	Ton	3,190	90,238	93,428	3,311	97,264	100,575
	\$	24,853	541,309	566,162	24,162	576,325	600,487
Anthracite coal.....	Ton	3	135	138	3	133	136
	\$	48	2,164	2,212	48	2,053	2,101
Coke.....	Ton	382	145,015	145,397	241	134,242	134,483
	\$	4,369	1,333,865	1,338,234	2,027	1,183,338	1,185,365
Gasoline.....	Imp. gal.	410	11,339	11,749	520	729	1,249
	\$	127	3,605	3,732	137	332	469
Kerosene.....	Imp. gal.				1,554	4,196	5,750
	\$				396	1,122	1,518
Fuel oil.....	Ton	29,901	2,539,566	2,569,467	40,173	2,355,466	2,395,639
	\$	3,785	235,858	239,643	4,857	192,652	197,509
Wood.....	Cord		5,780	5,780		5,479	5,479
	\$		38,934	38,934		40,710	40,710
Gas (natural).....	M cu. ft.		144	144		337	337
	\$		115	115		299	299
Other fuel.....	\$					14	14
Electricity purchased.....	K.W.H.	32,344,297	71,656,081	104,000,378	37,351,166	84,989,531	122,340,697
	\$	62,439	186,732	249,171	89,059	236,476	325,535
Total.....	\$	95,621	2,342,582	2,438,203	120,686	2,233,321	2,354,007

Table 199.—Power Employed in the Nickel-Copper Industry in Canada, 1926 and 1927

	1926			1927		
	Mines	Smelters and refinery	Total	Mines	Smelters and refinery	Total
Steam engines and turbines.....No. units		17	17		17	17
H.P.		4,655	4,655		4,655	4,655
Gasoline, gas and oil engines.....No. units		1	1		1	1
H.P.		53	53		53	53
<i>Total primary power.....No. units</i>		18	18		18	18
<i>H.P.</i>		4,708	4,708		4,708	4,708
Electric motors run by purchased power.....No. units	165	482	647	199	511	710
H.P.	15,345	30,692	46,037	16,138	34,992	51,130
Total power employed...No. units	165	500	665	199	529	728
H.P.	15,345	35,400	50,745	16,138	39,706	55,838
<i>Total electric motors.....No. units</i>	<i>165</i>	<i>482</i>	<i>647</i>	<i>199</i>	<i>511</i>	<i>710</i>
<i>H.P.</i>	<i>15,345</i>	<i>30,692</i>	<i>46,037</i>	<i>16,138</i>	<i>34,992</i>	<i>51,130</i>
Boilers.....No. units		12	12		12	12
H.P.		5,200	5,200		5,200	5,200

2. Commodity Statistics on Nickel, Copper and Metals of the Platinum Group

NICKEL

Nickel production in 1927 amounted to 66,798,717 pounds valued at \$15,262,171 as against the 1926 production of 65,714,294 pounds valued at \$14,374,163. These figures include nickel in matte and speiss exported from the Canadian smelters valued at 18 cents per pound; refined and electrolytic nickel produced in Canada, valued at the average price received for sales of nickel metal from the refinery during the year, and the nickel equivalent in oxides and salts sold, valued in the aggregate at the sum obtained from the sales of oxides and salts.

Table 200.—Production of Nickel from Canadian Ores, 1889-1927

Year	Pounds of nickel	Value	Year	Pounds of nickel	Value
1889.....	830,477	\$ 498,286	1909.....	26,282,991	\$ 9,461,877
1890.....	1,435,742	933,232	1910.....	37,271,033	11,181,310
1891.....	4,035,347	2,421,208	1911.....	34,098,744	10,229,623
1892.....	2,413,717	1,399,956	1912.....	44,841,542	13,452,463
1893.....	3,982,982	2,071,151	1913.....	49,676,772	14,903,032
1894.....	4,907,430	1,870,958	1914.....	45,517,937	13,655,381
1895.....	3,888,525	1,360,984	1915.....	68,308,657	20,492,597
1896.....	3,397,113	1,188,990	1916.....	82,958,564	29,035,497
1897.....	1,399,647	1,399,176	1917.....	84,330,280	33,732,112
1898.....	5,517,690	1,820,838	1918.....	92,507,293	37,002,917
1899.....	5,744,000	2,067,840	1919.....	44,544,883	17,817,953
1900.....	7,080,227	3,327,707	1920.....	61,335,706	24,534,282
1901.....	9,189,047	4,594,523	1921.....	19,293,060	6,752,571
1902.....	10,693,410	5,025,903	1922.....	17,597,123	6,158,993
1903.....	12,505,510	5,002,204	1923.....	62,453,843	18,332,077
1904.....	10,547,883	4,219,153	1924.....	69,536,350	19,470,178
1905.....	18,876,315	7,550,526	1925.....	73,857,114	15,946,672
1906.....	21,490,955	8,948,834	1926.....	65,714,294	14,374,163
1907.....	21,189,793	9,535,407	1927.....	66,798,717	15,262,171
1908.....	19,143,111	8,231,538			
			Total.....	1,217,791,824	405,264,283

Table 201.—Production in Canada, Imports and Exports of Nickel 1925-1927

	1925		1926		1927	
	Quantity Pounds	Value \$	Quantity Pounds	Value \$	Quantity Pounds	Value \$
PRODUCTION—						
Nickel in matte and speiss exported*	32,787,846	5,901,812	34,028,211	6,125,078	31,584,097	5,685,138
Refined and electrolytic nickel produced	31,976,310	7,315,701	25,627,602	6,423,401	28,469,996	7,497,436
Nickel in oxides and salts sold	9,092,958	2,729,159	6,058,481	1,825,684	6,744,624	2,079,597
Total	73,857,114	15,946,672	65,714,294	14,374,163	66,798,717	15,262,171
IMPORTS—						
Nickel, nickel silver and German silver, in ingots or blocks, n.o.p.*	6,758	1,398	12,253	4,897	1,549,692	547,138
Nickel in bars and rods, strips, sheets and plates	832,775	150,167	1,001,247	206,466	825,715	233,363
Nickel silver and German silver, in bars, rods, strips, sheets, plates or anodes	220,429	60,144	104,866	31,491	77,940	26,639
German, Nevada and nickel silver, manufactures of, not plated		224,984		312,568		333,916
Nickel-plated household hollow-ware		22,907		17,461		81,562
Nickel-plated ware, n.o.p.		1,371,161		1,526,959		2,113,246
Total nickel and its products		1,830,761		2,099,842		3,335,867
EXPORTS—						
Nickel, fine	40,207,900	6,693,805	24,698,400	6,386,387	29,015,800	7,896,211
Nickel contained in matte	30,116,400	5,980,920	39,177,400	6,074,497	36,458,800	5,784,623
Nickel oxide					5,196,100	1,600,986
Total	70,324,300	12,674,725	63,875,800	12,460,884	70,670,700	15,281,820

*Nickel in matte and speiss exported valued at 18 cents per pound.

New outlets have been found in part in the adaptability of nickel for the cooking-utensil trade, in the manufacture of resistance wires in electric heating appliances, as a material for coinage, as a constituent of numerous alloys, and in the growing use of the metal in the motor car industry. The average price per pound in recent years has been as follows: 1921, 35.0 cents; 1922, 35.0 cents; 1923, 29.3 cents; 1924, 28.0 cents; 1925, 34.0 cents; 1926, 36.0 cents; 1927, 36.0 cents.

Table 202.—World Production of Nickel Ore, 1923-1927

(In terms of metal)

*(From *The Mineral Industry of the British Empire and Foreign Countries.*)

(Short tons)

Country	1923	1924	1925	1926	1927
British Empire—					
Canada	31,225	34,768	36,929	32,860	33,399
Australia					96
*Foreign Countries—					
Germany	(a) 3				
Italy	49	1	7		
Norway	68				
(b) United States	100	192	272	306	860
(c) New Caledonia	2,939	4,032	3,718	4,211	3,543
Total	34,384	38,993	40,926	37,377	37,898

(a) Ore, nickel content not stated.

(b) Nickel content of salts and nickel produced as a by-product in the electrolytic refining of copper as reported by the United States Department of Commerce, Washington.

(c) Exports.

* In addition, Norway produced 7,492 long tons of nickel ore in 1927.

COPPER

CANADA

Copper production from Canadian ores in 1927 amounted to 140,147,440 pounds valued at \$17,195,487 as compared with 133,094,942 pounds valued at \$17,490,300 in 1926. This was an increase of 5 per cent in quantity and a decrease of 1·7 per cent in value.

During 1927, British Columbia produced 66 per cent of the total Canadian output; Ontario 32 per cent; and Quebec 2 per cent.

Production in 1927 included (a) 46,210,393 pounds contained in ores and concentrates exported and (b) 93,937,047 pounds of copper in blister copper made, in matte exported and in copper sulphate made during the year. The corresponding figures for 1926 were: (a) 43,597,943 pounds, and (b) 89,496,999 pounds.

Table 203.—Production of Copper from Canadian Ores, 1886-1927

Year	Pounds	Value	Cents per pound	Year	Pounds	Value	Cents per pound
		\$				\$	
1886.....	3,505,000	385,550	11·00	1908.....	63,702,873	8,413,876	13·208
1887.....	3,260,424	366,798	11·25	1909.....	52,493,863	6,814,754	12·982
1888.....	5,562,864	927,107	16·66	1910.....	55,692,369	7,094,094	12·738
1889.....	6,809,752	936,341	13·75	1911.....	55,648,011	6,886,998	12·376
1890.....	6,013,671	947,153	15·75	1912.....	77,832,127	12,718,548	16·341
1891.....	9,529,401	1,226,703	12·87	1913.....	76,976,925	11,753,606	15·269
1892.....	7,087,275	818,580	11·55	1914.....	75,735,960	10,301,606	13·602
1893.....	8,109,856	871,809	10·75	1915.....	100,785,150	17,410,635	17·275
1894.....	7,708,789	736,960	9·56	1916.....	117,150,028	31,867,150	27·202
1895.....	7,771,639	836,228	10·76	1917.....	109,227,332	29,687,989	27·180
1896.....	9,393,012	1,021,960	10·88	1918.....	118,769,434	29,250,536	24·628
1897.....	13,300,802	1,501,660	11·29	1919.....	75,053,581	14,028,265	18·691
1898.....	17,747,136	2,134,980	12·03	1920.....	81,600,691	14,244,217	17·456
1899.....	15,078,475	2,655,319	17·61	1921.....	47,620,820	5,953,555	12·502
1900.....	18,937,138	3,065,922	16·19	1922.....	42,879,818	5,738,177	13·382
1901.....	37,827,019	6,096,581	16·117	1923.....	86,881,537	12,529,186	14·421
1902.....	38,804,259	4,511,383	11·626	1924.....	104,457,447	13,604,538	13·024
1903.....	42,684,454	5,649,487	13·235	1925.....	111,450,518	15,649,882	14·042
1904.....	41,383,722	5,306,635	12·823	1926.....	133,094,942	17,490,300	*
1905.....	48,092,753	7,497,660	15·590	1927.....	140,147,440	17,195,487	*
1906.....	55,609,888	10,720,474	19·278	Total.....	2,188,397,400	358,246,809	
1907.....	56,979,205	11,398,120	20·004				

*In 1926 and 1927 the value of Canada's copper production was computed according to the note on page 375.

Table 204.—Production of Copper in Canada by Provinces, 1926 and 1927

Province	1926		1927	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	2,674,058	368,886	3,119,848	403,084
Ontario.....	41,312,867	4,828,964	45,341,295	4,946,533
British Columbia.....	89,108,017	12,292,450	91,686,297	11,845,870
Total.....	133,094,942	17,490,300	140,147,440	17,195,487

Refined copper was produced commercially in quantity for the first time in Canada in 1916, at the Trail refinery of the Consolidated Mining and Smelting Company. The British America Nickel Corporation which produced refined copper at the Deschenes refinery for the first time in 1920, went into liquidation during July, 1924.

Production of Refined Copper in Canada, 1916-1927

CALENDAR YEAR		Tons
1916	.....	483
1917	.....	3,901
1918	.....	3,809
1919	.....	3,467
1920	.....	2,590
1921	.....	2,143
1922	.....	365
1923	.....	824
1924	.....	1,768
1925	.....	170
1926	.....	10,581
1927	.....	9,191

Copper sulphate was produced at Trail, B.C., by the Consolidated Mining and Smelting Company. Formerly, the Coniagas Reduction Company at Thorold, Ontario, was also a producer of this commodity. The outputs in recent years have been as follows: in 1921—643,910 pounds; in 1922—230,835 pounds; in 1923—307,135 pounds; in 1924—127,301 pounds; in 1925—121,746 pounds; in 1926—404,862 pounds; and in 1927—566,825.

QUEBEC

Production of copper from the province of Quebec amounted to 3,119,848 pounds as against 2,674,058 pounds in 1926. This total included the estimated recovery of copper contained in concentrates shipped from the Consolidated Copper and Sulphur Company, Limited (formerly the Eustis mine) and the copper in blister copper made at the Noranda smelter during the last two weeks of December.

Table 205.—Production of Copper from Quebec Ores, 1886-1927

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1886	3,340,000	387,400	1901	1,527,442	246,178	1916	5,703,347	1,551,424
1887	2,937,900	330,514	1902	1,640,000	190,666	1917	5,015,560	1,363,229
1888	5,562,864	927,107	1903	1,152,000	152,467	1918	5,869,649	1,445,577
1889	5,315,000	730,813	1904	760,000	97,455	1919	2,691,695	503,105
1890	4,710,606	741,920	1905	1,621,243	252,752	1920	880,638	153,724
1891	5,401,704	695,469	1906	1,981,169	381,930	1921	352,302	44,045
1892	4,883,480	564,042	1907	1,517,990	303,659	1922		
1893	4,468,352	480,348	1908	1,282,024	169,330	1923		
1894	2,176,430	208,067	1909	1,088,212	141,272	1924	1,893,008	246,546
1895	2,242,462	241,288	1910	877,347	111,757	1925	2,510,141	352,474
1896	2,407,200	261,903	1911	2,436,190	301,503	1926	2,674,058	368,886
1897	2,474,970	279,424	1912	3,282,210	536,346	1927	3,119,848	403,084
1898	2,100,235	252,658	1913	3,455,887	527,679			
1899	1,632,560	287,494	1914	4,201,497	571,488			
1900	2,220,000	359,418	1915	4,197,482	725,115	Total	113,604,708	17,869,556

ONTARIO

Statistics of copper production in Ontario for 1927 included the copper contained in converter copper made at Port Colborne, Ontario, by the International Nickel Company, Limited, the copper in nickel-copper matte exported by the International Nickel Company, Limited, and the Mond Nickel Company, Limited; the recoverable copper in flotation concentrates exported by the mines of the Cobalt district, and the recoverable copper in concentrates exported by the Argonaut Gold mine. As thus computed, the total output for 1927 amounted to 45,341,295 pounds as against a production of 41,312,867 pounds in 1926.

The bounty offered by the Ontario government on copper 95 per cent pure and on copper sulphate produced from ore mined and refined in the province was never gained and the Act, known as the *Metal Refining Bounty Act* warranting the bounty, which expired April 10, 1917, was not re-enacted.

Table 206.—Production of Copper from Ontario Ores, 1886-1927

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1886.....	165,000	18,150	1901.....	8,695,831	1,401,507	1916.....	44,997,035	12,240,094
1887.....	322,524	36,284	1902.....	7,408,202	861,278	1917.....	42,867,774	11,651,461
1888.....			1903.....	7,172,533	949,285	1918.....	47,074,475	11,593,502
1889.....	1,466,752	201,678	1904.....	4,913,594	630,070	1919.....	24,346,623	4,550,627
1890.....	1,303,065	205,233	1905.....	8,779,259	1,368,686	1920.....	32,059,993	5,596,392
1891.....	4,127,697	531,234	1906.....	10,638,231	2,050,838	1921.....	12,821,385	1,602,930
1892.....	2,203,795	254,538	1907.....	14,104,337	2,821,432	1922.....	10,943,636	1,464,477
1893.....	3,641,504	391,461	1908.....	15,005,171	1,981,883	1923.....	31,656,800	4,565,227
1894.....	5,207,679	497,854	1909.....	15,746,699	2,044,237	1924.....	37,113,193	4,833,622
1895.....	4,576,337	492,414	1910.....	19,259,016	2,453,213	1925.....	39,718,777	5,577,811
1896.....	3,167,256	344,598	1911.....	17,932,263	2,219,297	1926.....	41,312,867	4,828,964
1897.....	5,500,652	621,023	1912.....	22,250,601	3,635,971	1927.....	45,341,295	4,946,533
1898.....	8,375,223	1,007,539	1913.....	25,885,929	3,952,522			
1899.....	5,723,324	1,007,877	1914.....	28,948,211	3,937,536			
1900.....	6,740,058	1,091,215	1915.....	39,361,464	6,799,693			
						Total.....	708,876,060	117,259,686

MANITOBA

During the years 1917 to 1920 the province of Manitoba was on record as one of the copper-producing provinces in Canada. The total production for the four years amounted to 9,866,328 pounds of copper having a total value of \$2,039,942. Production in each year was as follows: 1917—1,116,000 pounds, valued at \$303,329; 1918—2,339,751 pounds valued at \$576,234; in 1919—3,348,000 pounds valued at \$625,775; and in 1920—3,062,577 pounds valued at \$534,604. These amounts were estimated as the recoverable copper in ores shipped by the Mandy Mining Company operating near Schist lake in The Pas district of northern Manitoba. No copper ores were shipped during the years 1921 to 1927.

BRITISH COLUMBIA

British Columbia, the greatest copper-producing province of the Dominion, was credited in 1927 with a production of 91,686,297 pounds, the greatest of any year on record, as against 89,108,017 pounds in 1926. The output from this province amounted to 66 per cent of the total Canadian production for 1927 as against 67 per cent in 1926.

In this total there are included the quantities of blister copper produced at Anyox by the Granby Consolidated Mining, Smelting and Power Company; blister copper made by the Consolidated Mining and Smelting Company at Trail; copper contained in copper sulphate made by the same company; and the copper estimated as recoverable from ores and concentrates exported. The principal copper-producing mines in British Columbia are the Britannia mine on Howe Sound which ships its concentrates to Tacoma, Washington, U.S.A.; the Hidden Creek mine on Portland Canal; and the Allenby Copper Corporation, owned and operated by the Granby Consolidated Mining, Smelting and Power Company, Limited. The Hidden Creek ores are smelted at the Anyox smelter and the Allenby concentrates, from Copper Mountain ore, are shipped to the Trail smelter. The Belmont Surf Inlet ceased operations June 30, 1926. Small shipments were made from the Rossland mines to the smelter at Trail.

Table 207.—Production of Copper from British Columbia Ores, 1894-1927

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1894*.....	324,680	31,039	1906*.....	42,990,488	8,287,706	1918.....	62,865,681	15,482,560
1895*.....	952,840	102,526	1907*.....	40,832,720	8,168,177	1919.....	44,502,079	8,317,884
1896*.....	3,818,556	415,459	1908.....	37,041,115	4,892,390	1920.....	45,319,771	7,911,019
1897*.....	5,325,180	601,213	1909.....	35,658,952	4,629,245	1921.....	34,447,127	4,306,580
1898*.....	7,271,678	874,783	1910.....	35,270,006	4,492,693	1922.....	31,936,182	4,273,700
1899*.....	7,722,591	1,359,948	1911.....	35,279,558	4,366,198	1923.....	55,224,737	7,963,959
1900*.....	9,977,080	1,615,289	1912.....	50,526,656	8,256,561	1924.....	65,451,246	8,524,370
1901*.....	27,603,746	4,448,896	1913.....	45,791,579	6,991,916	1925.....	69,221,600	9,720,097
1902*.....	29,636,057	3,445,488	1914.....	41,219,202	5,606,636	1926.....	89,108,017	12,292,450
1903*.....	34,359,921	4,547,735	1915.....	56,692,988	9,793,714	1927.....	91,686,297	11,845,870
1904*.....	35,710,128	4,579,110	1916.....	63,642,550	17,312,046			
1905*.....	37,692,251	5,876,222	1917.....	57,730,959	15,691,275	Total.....	1,332,834,218	217,024,754

*Metal content of ores shipped as published by the Provincial Bureau of Mines.

YUKON

There are important deposits of copper bearing ore in the Yukon Territory some of which were operated during the period from 1906 until 1920. Since then no production of copper has been reported, and the grand total for the Territory remains at 12,912,507 pounds, or a little greater than that of Manitoba.

Table 208.—Production of Copper from Yukon Ores, 1906-1927

Year	Pounds	Value	Year	Pounds	Value
		\$			\$
1906 (and previous).....	156,000	23,400	1915.....	533,216	92,113
1907.....	511,838	102,388	1916.....	2,807,096	763,586
1908.....	112,264	14,828	1917.....	2,460,079	668,650
1909.....			1918.....	619,878	152,663
1910.....	286,000	36,431	1919.....	165,184	30,874
1911.....			1920.....	277,712	48,478
1912.....	1,772,660	289,670	1921-1927.....		
1913.....	1,843,530	281,489			
1914.....	1,367,050	185,946	Total.....	12,912,507	2,690,516

Imports into Canada of manufactured copper were valued at \$7,514,557, an increase of over three-quarters of a million dollars from the total for the preceding year.

During 1920 the value of copper in its various forms exported from Canada, reached \$15,877,306, a value that has never been surpassed. In 1927 the total exports of copper were valued at \$14,952,779, making a slight decrease from the total for the previous year. The two major export items were "Copper, blister" valued at upwards of 6 million dollars and "copper, contained in ore" which accounted for more than 7.3 million dollars.

Table 209.—Imports into Canada and Exports of Copper, 1925-1927

	1925		1926		1927	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
IMPORTS—						
Copper in bars or rods, when imported by manufacturers of trolley, telegraph and telephone wires, electric wires and electric cables for use only in the manufacture of such articles in their own factories.....	26,385,300	3,857,482	15,131,400	2,212,715	26,384,000	3,719,260
Copper in bars or rods, in coil or otherwise, in lengths of not less than 6 feet, unmanufactured.....	482,500	95,563	2,627,000	490,222	732,100	128,144
Copper in blocks, pigs or ingots.....	7,934,779	1,138,740	8,599,699	1,231,422	3,795,607	510,771
Copper, old and scrap.....	4,174,100	572,656	3,039,400	408,999	5,817,100	737,029
Copper, ore and concentrates.....	300	269	1,700	927	500	530
Copper, in strips, sheets or plates not polished or coated.....	1,971,300	400,229	1,882,400	406,988	1,836,700	385,477
Copper tubing in lengths of not less than 6 feet, and not polished, bent or otherwise manufactured.....	1,611,987	390,881	2,535,796	579,044	2,124,343	506,745
Copper wire, plain, tinned or plated.....	287,654	104,686	420,361	111,504	434,372	108,662
Copper wire cloth, or woven wire of copper.....		4,379		51,390		19,580
Copper wire, single or several, covered with cotton, linen, silk, rubber or other material, including cable so covered.....		487,779		502,395		509,312
Copper, all other, manufactures of, n.o.p.....		415,625		578,068		644,534
Copper, precipitate of, crude.....		661				
Anodes of nickel, zinc, copper, silver or gold.....		4,084		4,896		10,050
Copper, sub-acetate of, or verdigris, dry.....	4,083	812	31,755	2,260	3,389	688
Copper, sulphate of (blue vitriol).....	3,027,088	146,833	3,385,239	158,992	4,110,695	198,553
Copper, sulphate of, dehydrated, for agricultural or spraying purposes.....	156,808	7,662	229,288	11,896	586,426	29,696
Copper rollers adapted for use in calico printing.....				350		5,526
Total.....		7,628,341		6,752,068		7,514,557
EXPORTS—						
Copper, fine, contained in ore, matte regulus, etc.....	60,527,500	6,969,960	67,108,300	7,822,260	72,841,200	7,371,542
Copper, blister.....	48,558,500	6,547,397	45,256,300	6,055,266	54,258,800	6,667,270
Copper, old and scrap.....	5,601,700	658,458	5,972,400	614,108	5,912,500	602,494
Copper, pig.....	1,100	126	58,200	7,127	11,200	1,734
Copper in bars, rods, strips, sheets, plates and tubing.....	156,300	45,599	256,900	72,475	248,100	63,165
Copper wire and cable.....		404,600		380,311		199,817
Copper mfrs., n.o.p.....		59,792		57,312		46,737
Total.....		14,685,932		15,008,859		14,952,779

According to the New York *Engineering and Mining Journal*, the average price of electrolytic copper for 1927 was 12·920 cents per pound as against 13·795 in 1926. The price in January was 12·990 cents per pound and in June it stood at 12·370 cents, the low point for the year. Prices showed a gradual improvement during the last half of the year and in December the peak price for 1927 of 13·774 cents was reached.

Table 210.—Monthly Average Prices of Copper (Electrolytic), New York and London, 1925-1927

(From the *Engineering and Mining Journal*)

	New York (In cents per pound)			London (£Sterling per long ton)		
	1925	1926	1927	1925	1926	1927
January.....	14.709	13.822	12.990	70.607	65.325	62.375
February.....	14.463	13.999	12.682	69.525	66.375	61.119
March.....	14.004	13.859	13.079	67.739	65.489	62.641
April.....	13.352	13.706	12.808	64.194	64.600	61.526
May.....	13.347	13.599	12.621	63.560	64.313	60.881
June.....	13.399	13.656	12.370	63.369	64.591	59.881
July.....	13.946	13.924	12.532	65.750	65.625	60.089
August.....	14.490	14.174	12.971	68.169	66.857	62.227
September.....	14.376	14.062	12.940	67.693	66.528	61.830
October.....	14.300	13.862	12.958	67.523	66.298	62.256
November.....	14.353	13.756	13.319	67.893	65.551	63.761
December.....	13.866	13.302	13.774	65.625	64.114	66.181
Average.....	14.042	13.795	12.920	66.804	65.472	62.064

Table 211.—(a) World Production of Copper 1913 and 1923-1927

(From the *Year Book of the American Bureau of Metal Statistics*.)

(Short tons)

Country	1913	1923	1924	1925	1926	1927
NORTH AMERICA—						
United States.....	614,255	754,000	819,000	854,000	878,000	847,419
Mexico.....	58,185	60,538	57,139	59,123	62,303	63,760
Canada (b).....	38,460	40,230	50,072	56,239	64,124	70,698
Cuba.....	3,747	11,963	12,742	13,128	13,034	15,538
Total, North America.....	714,647	866,731	938,953	982,490	1,017,461	997,415
SOUTH AMERICA—						
Bolivia.....	4,077	11,744	8,200	7,500	7,100	7,850
Chile.....	46,574	201,042	208,964	212,150	223,015	264,242
Peru.....	30,609	48,684	37,410	40,635	46,703	52,438
Venezuela.....		1,175	1,230	1,500	1,000	150
Total, South America.....	81,260	262,645	255,804	261,785	277,818	324,680
EUROPE—						
Austria-Hungary (c).....	4,518	5,327	4,242	3,665	4,099	3,968
France.....		6,204	2,568	3,769	2,370	*2,480
Germany.....	27,881	20,282	25,132	26,235	26,455	31,306
Jugo-Slavia.....		7,536	8,978	8,048	10,692	14,220
Norway.....	3,021	8,816	10,913	13,779	13,779	13,227
Russia.....	37,358	2,205	3,637	7,251	11,943	*13,227
Spain and Portugal.....	39,683	57,115	61,839	63,933	63,933	60,351
Sweden.....	4,645	5,180	3,086	2,500		
Serbia.....	7,053					
Total, Europe.....	124,159	112,665	120,395	129,180	133,271	138,779
ASIA—						
Japan.....	73,283	65,417	69,507	73,289	72,277	69,872
Other, Asia.....		810	2,315	3,600	6,100	6,100
Total, Asia.....	73,283	66,227	71,822	76,889	78,377	75,972
AUSTRALASIA.....	49,901	19,995	15,711	13,578	11,244	12,800
AFRICA.....	25,236	80,410	115,300	118,670	108,010	120,763
OTHER COUNTRIES.....	4,188	*3,307	*4,409	*4,409	*4,409	*4,409
Grand total.....	1,072,674	1,411,950	1,522,394	1,587,001	1,630,590	1,674,818

(a) So far as possible, these statistics are based on blister copper, referred to countries wherein ore originated.

(b) For Dominion Bureau of Statistics figures on Canada's production of copper, see Table 1.

(c) After 1918, Austria only.

*Conjectural.

METALS OF THE PLATINUM GROUP

Metals of the platinum group produced from Canadian ores in 1927 amounted in value to \$1,271,803 as compared with \$1,563,785 in 1926.

The 1927 production included 11,217 ounces of platinum valued at \$716,653 and 11,545 ounces of palladium, rhodium, iridium, etc., valued at \$554,190, all reported as being recovered in the refining of the nickel-copper matte from the Sudbury district, and 11 ounces of platinum valued at \$960 from British Columbia placers.

Canada stands third in the world's production of these metals, larger amounts coming from Russia, and Colombia, South America. In British Columbia, small quantities of platinum are found in placer deposits with alluvial gold and black sands; in Ontario these rare metals occur with the nickel-copper-sulphide ores of the Sudbury district. Copper-nickel matte containing the precious metals is made at Coniston by the Mond Nickel Company, Limited, and at Copper-cliff by the International Nickel Company, Limited. The International matte is shipped either to the United States, for manufacture into monel metal, or to Port Colborne, Ontario, for refining. When the copper and nickel are removed, the residues are further refined for the recovery of gold, silver, platinum and palladium and smaller amounts of rhodium and iridium. The Mond matte is shipped to Clydach, Wales, where the metals of the platinum group are recovered in the refining process.

Imports into Canada of platinum crucibles were valued at \$8,581 in 1927 as against \$8,960 in 1926. There were slight reductions in the volume of imports of platinum wire and bars, strips, sheets or plates, and in retorts, pans, condensers, etc., in 1927 as compared with 1926.

Exports, consisting of jewellers' sweepings, ores and concentrates, and old and scrap platinum, were slightly less in 1927 than in the previous year.

The average price of platinum in 1927 was \$84.636 per fine ounce as against \$113.269 in 1926. At the beginning of the year quotations were around \$109.520 in New York but this price gradually fell away until June when the average quotation for the month was \$72 at which price it stood for the remainder of the year.

Table 212.—Production of Metals of the Platinum Group from Canadian Sources, 1926 and 1927

Source	1926		1927	
	Platinum	Palladium, Rhodium, etc.	Platinum	Palladium, Rhodium, etc.
Produced by refineries in Canada or elsewhere, from Canadian matte and residues.....	Fine oz. 9,471 Value \$ 919,349	10,024 640,178	11,217 716,653	11,545 554,190
British Columbia placers.....	Fine oz. 50 Value \$ 4,258	..... .....	11 960	..........
Canada.....	Fine oz. 9,521 Value \$ 923,607	10,024 640,178	11,228 717,613	11,545 554,190

Table 213.—Production of Platinum in Canada from Alluvial Sands, 1887-1927

Year	Value	Year	Value	Year	Fine ounces	Value
	\$		\$			\$
1887.....	5,600	1897.....	1,600	1913.....	18	499
1888.....	6,000	1898.....	1,500	1914.....		
1889.....	3,500	1899.....	825	1915.....	23	1,063
1890.....	4,500	1900.....		1916.....	15	600
1891.....	10,000	1901.....	457	1917.....	57	3,823
1892.....	3,500	1902.....	190	1918.....	39	2,506
1893.....	1,800	1903.....		1919.....	25	2,105
1894.....	950	1904.....	420	1920.....	17	791
1895.....	3,800	1905.....	500	1921.....	23	1,558
1896.....	750	1906.....		1922.....	12	1,154
		1907-1912.....		1923.....	7	816
				1924.....	5	569
				1925.....	6	715
				1926.....	50	4,258
				1927.....	11	960

Table 214.—Recovery of Precious Metals at the International Nickel Company's Works*—New Jersey, U.S.A., 1907-1922

Year	Matte treated	Gold	Silver	Platinum	Palladium	Rhodium	Other
	Tons	Fine ounces	Fine ounces	Fine ounces	Fine ounces	Fine ounces	Fine ounces
1907.....	17-840	993-572	63,400-70	226-800	607-300	(a)	.....
1908.....	18-839	5,238-131	139,329-29	172-316	328-287	(a)	.....
1909.....	18-407	2,113-669	63,138-66	546-627	1,270-598	(a)	.....
1910.....	24-309	2,649-799	60,256-83	258-325	522-804	(a)	.....
1911.....	26-840	2,203-052	70,954-38	655-552	753-363	(a)	.....
1912.....	27-653	2,476-558	62,169-66	496-850	680-130	(a)	.....
1913.....	38-733	2,336-405	77,924-03	192-863	207-713	191-067	.....
1914.....	40-267	2,695-957	75,928-18	748-440	756-360	515-801	.....
1915.....	31-428	3,444-785	101,793-17	452-430	543-240	57-475	.....
1916.....	56-405	3,495-123	110,285-21	1,016-581	1,344-915	257-070	.....
1917.....	59-209	1,954-934	92,963-67	970-695	1,354-459	325-407	.....
1918.....	62-250	1,968-703	107,076-78	649-737	786-654	472-579	.....
1919.....	19-528	634-043	35,689-79	616-716	762-217	227-294	(b) 76-613
1920.....	30-740	613-338	81,882-78	488-901	739-158	390-336	(b) 102-363
1921.....	(c) 2,217-000	6-901	1,242-74	281-582	382-626	256-110	(b) 10-655
1922.....	(c) 3,112-000	206-542	12,211-66	137-882	300-839	103-874	(b) 20-563

*Plant dismantled during 1922.

(a) Figures not given separately.

(b) Includes Osmium, Iridium and Ruthenium.

(c) These quantities bear no relation to the amounts of precious metals recovered.

Platinum is recovered in a small way at the Royal Mint in the form of platinum black a dull black powder of metallic platinum, obtained from the treatment of dental and old jewellery scrap. The following tables show the recoveries since 1923.

Table 215.—Recovery of Platinum Black, at the Royal Mint, Ottawa, 1923-1927

	Platinum	
	Ounces gross	Value
		\$
1923.....	4-520	393.47
1924.....	16-186	1,408.99
1925.....	9-500	*
1926.....	10-700	*
1927.....	54-150	*

*No sales.

Table 216.—Imports into Canada and Exports of Platinum, 1925-1927

	1925		1926		1927	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$
IMPORTS—						
Crucibles.....		39,685		8,960		8,581
Wire and bars, strips, sheets or plates.....		157,914		138,433		94,538
Retorts, pans, condensers, etc.....		41,006		40,028		26,901
Total.....		238,605		187,421		130,020
EXPORTS—						
Jeweller's sweepings.....		322,295		326,007		336,081
Ores and concentrates.....	404	42,489	520	54,747	771	52,660
Old and scrap.....	655	76,423	396	40,185	221	15,789
Total.....		441,207		420,939		404,530

Table 217.—Monthly Average Prices of Platinum, 1925-1927(From *The Engineering and Mining Journal*)

(In dollars per fine ounce)

Month	1925	1926	1927
	\$	\$	\$
January.....	117.000	118.200	109.520
February.....	117.000	113.909	107.545
March.....	117.000	112.000	108.000
April.....	118.289	111.538	101.885
May.....	119.850	108.960	84.680
June.....	120.000	111.000	72.000
July.....	120.000	114.692	72.000
August.....	120.000	116.000	72.000
September.....	120.000	116.840	72.000
October.....	120.000	112.240	72.000
November.....	120.000	112.000	72.000
December.....	120.000	111.846	72.000
Average.....	119.093	113.269	84.636

Table 218.—Platinum Metals Consumed in the United States as Reported by Refiners and by Industries, 1926 and 1927(From *Mineral Resources of the United States*, 1927.)

(In Troy ounces)

Industry	Platinum	Iridium	Palladium	Others	Total	Percentage of total
1926						
Chemical.....	10,253	145	213	228	10,839	6
Electrical.....	16,765	1,608	3,508	185	22,066	13
Dental.....	8,542	131	11,063	.....	19,736	11
Jewellery.....	85,908	2,949	7,770	454	97,081	57
Miscellaneous.....	17,381	581	2,181	1,751	21,894	13
Total.....	138,849	5,414	24,735	2,618	171,616	100
1927						
Chemical.....	11,010	180	101	175	11,466	8
Electrical.....	14,905	2,491	1,618	121	19,135	13
Dental.....	7,504	12,194	153	.....	19,851	13
Jewellery.....	86,036	3,706	4,059	329	94,130	63
Miscellaneous.....	3,176	312	305	1,311	5,104	3
Total.....	122,631	18,883	6,236	1,936	149,686	100

Table 219.—World Production of Platinum (a), 1912-1927

(In troy ounces, fine platinum)

(From *The Mineral Industry* 1927)

Year	Australia	Canada (b)	Colombia	Russia	South Africa	United States (b)	Total
1912.....	463	497 (d)	27,071 (c)	250,000		1,005	279,036
1913.....	335	311 (d)	17,635 (c)	210,000		1,034	229,315
1914.....	185	..... (d)	16,264 (c)	202,000		1,484	219,933
1915.....	43	475 (d)	18,749 (c)	104,000	(e)	1,190	124,457
1916.....	62	1,040 (d)	25,592 (c)	53,000	(e)	2,780	83,474
1917.....	197	1,036 (d)	26,421	98,474	(e)	6,280	132,408
1918.....	461	705 (d)	34,266	43,181	(e)	9,740	88,353
1919.....	162	690 (d)	32,236	39,425	(e)	10,460	82,972
1920.....	640	4,345 (c)	33,500	11,323	(e)	11,500	61,308
1921.....	189	5,412 (c)	34,000	5,500		2,899	48,000
1922.....	61	4,802 (d)	43,574	22,500		1,998	72,935
1923.....	445	6,810 (d)	40,676	34,700		2,114	84,745
1924.....	490	9,186 (d)	46,533	56,900		3,523	116,632
1925.....	436	8,698 (e)	56,000	94,800		4,325	164,259
1926.....	.....	9,521 (e)	55,000	92,700	4,951	4,923 (e)	167,500
1927.....	.....	11,217	.....	.....	10,431	4,449	.....

(a) Estimated content of fine platinum contained in crude platinum output. There has been a small production in some years from India, Borneo, Japan and other countries, but none of importance.

(b) Platinum of domestic source recovered by refiners.

(c) Estimated by J. M. Hill, U.S. Bureau of Mines.

(d) Exports.

(e) Estimated.

CHAPTER SIX

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics, Showing Production by Provinces, Imports, Exports, Prices and World Output Tables on Aluminium, Antimony, Chromite, Iron Ore, Pig Iron and Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten.

1. General Review

Several metallic minerals, produced in each case by a single operator, or perhaps by a few operators, only, have been grouped in this report for consideration as a single industry. There is little that can be said in a general way about these various producers. Iron and steel, and aluminium are products of large, well-organized concerns, but both of these products are made in Canada solely from imported ores. Aluminium smelting is, therefore, of interest to the mining industry wholly because of the processes employed in the reduction of the metal from bauxite ore. Iron ore is found in Canada in very extensive deposits, but as the grade available cannot be economically used without beneficiation, very little Canadian ore has been mined in recent years. Imported iron ore used in Ontario is mostly from the Mesabi range, Minnesota, U.S.A., while in the Maritime provinces, Wabana ore, mined on Bell Island, Newfoundland, is chiefly used.

Other metallic mineral industries reviewed in this chapter, include the production of antimony, chromite, manganese, mercury, molybdenum, tin and tungsten but these enterprises are relatively small, and their importance is largely determined by the extent of available supplies from other countries. When, as during the great war, production from other sources was insufficient to meet the increased demands for such products as chromite and manganese, the output from Canadian deposits found ready markets. At other times, with larger supplies available, from various sources, operation of the Canadian properties has been found somewhat difficult because of the keen competition of other producers.

During the great war, some of these smaller industries attained very considerable importance, and it is always possible, that some commercial development may occur that will lead once, again, to appreciable expansion in these somewhat neglected fields.

For historical purposes and to provide the interested reader with the available data, tables have been prepared for this report that set out the known facts regarding production in these industries.

In 1927 the miscellaneous group included two titaniferous iron ore properties in Quebec, one of which reported shipments; one developing molybdenite property in Quebec, one developing antimony mine in New Brunswick, and one developing tungsten property in Nova Scotia. In these there was invested \$641,600 in lands, buildings, supplies on hand, etc. Sixty-five men were employed and salaries and wages totalled \$23,944. Fuel costs amounted to \$460 and the products sold returned \$8,980 to the operators. In 1926 this group included only one iron mine and one molybdenite property. The capital employed amounted to \$87,588 and wages paid to 25 men amounted to \$10,626; fuel and electricity cost \$3,844 and products sold were valued at \$11,072.

Table 220.—Principal Statistics in the Miscellaneous Metal Mining Industries in Canada, 1923-1927

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages paid	Miscellaneous expenses	Cost of fuel and electricity	Net value of ore, concentrates, etc. shipped by mines
			\$		\$	\$	\$	\$
1923 (a).....	6	6	5,504,796	42	34,687	10,026	2,257	168,994
1924 (b).....	4	4	5,000	42	16,436	990	4,010	17,394
1925 (c).....	3	3	109,583	33	17,301	*	2,007	23,110
1926 (d).....	2	2	87,588	25	10,626	*	3,844	11,072
1927 (e).....	5	5	641,600	65	23,914	*	460	8,980

(a) Includes data for 3 iron mines, 1 chromite mine and 2 manganese mines.

(b) Includes data for 2 iron mines, 1 molybdenite mine and 1 manganese mine.

(c) Includes data for 1 iron mine, 1 molybdenite mine and 1 cinnabar prospect.

(d) Includes data for 1 iron mine and 1 molybdenite mine.

(e) Includes data for 2 iron mines, 1 molybdenite mine, 1 tungsten mine and 1 antimony mine.

*Data not available.

Table 221.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1926 and 1927

	1926			1927		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
Salaried Employees—						
Total.....	2		2,455	5		2,960
Wage-Earners—						
Surface.....	18		8,171	40		20,984
Underground.....	5			20		
Total.....	23		8,171	60		20,984
Total.....	25		10,626	65		23,944

Table 222.—*Wage-Earners in the Miscellaneous Metal Mining Industries in Canada, by Months, 1926 and 1927

Month	1926				1927			
	Number of wage-earners				Number of wage-earners			
	Surface	Under-ground	Mill	Total	Surface	Under-ground	Mill	Total
January.....								
February.....								
March.....					3	2		5
April.....			4	4	5	4		9
May.....	8		5	13	7	6		13
June.....	8		5	13	10	10		20
July.....	12	5	5	22	10	10		20
August.....	12	5	5	22	14	5		19
September.....	10		5	15	25	13		38
October.....	8		5	13	36	10		46
November.....	7		5	12	38	9		47
December.....					18	14		32

*See note page 30.

Table 225.—Imports of Aluminium and its Products into Canada and Exports of Aluminium, 1925-1927

	1925		1926		1927	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
IMPORTS—						
Alumina.....	127,500,400	2,627,281	145,145,500	3,118,205	253,235,300	6,036,019
Cryolite ore.....	1,507,600	94,624	6,400,900	369,688	2,448,300	164,437
Aluminium—						
Ingots, blooms, bars.....	692,426	217,885	962,417	270,517	1,114,511	331,335
Tubing.....	82,086	45,409	76,113	42,003	97,644	50,128
Manufactures, n.o.p.....		519,653		598,790		780,676
Leaf foil.....		202,823		202,547		260,936
Household and hollow-ware.....		342,116		268,268		271,680
Total.....		4,649,791		4,870,018		7,895,211
EXPORTS—						
Aluminium—						
Ingots, bars, etc.....	27,267,800	6,558,910	25,177,000	5,900,547	51,902,400	10,544,195
Scrap.....			353,800	50,888	543,500	66,534
Manufactures.....		793,170		1,188,260		403,230
Total.....		7,352,080		7,139,695		11,013,959

Table 226.—Monthly Average Prices of Ingot Aluminium, 1925-1927

(At New York in cents per pound 98 per cent grade)

From the (*Engineering and Mining Journal*)

Month	1925	1926	1927
January.....	28.00	27.000	26.270
February.....	28.00	27.000	26.000
March.....	28.00	27.000	26.000
April.....	28.00	27.000	26.000
May.....	28.00	27.000	26.000
June.....	28.00	27.000	26.000
July.....	28.00	27.000	26.000
August.....	28.00	27.000	26.000
September.....	28.00	27.000	26.000
October.....	28.00	27.000	25.600
November.....	29.00	27.000	25.000
December.....	29.00	26.934	24.785
Average.....	28.17	26.955	25.808

Table 227.—World Production of Aluminium, 1913 and 1923-1927

(From *The Mineral Industry*, 1927)*

(Metric tons)

Country	1913	1923	1924	1925	1926	1927
Austria.....	5,000	4,000	3,000	4,000	2,700	3,000
Canada.....	5,916	16,500	16,000	17,000	18,000	27,000
France.....	13,503	14,343	16,315	18,403	21,000	20,000
Germany.....	800	15,900	18,400	25,000	30,000	31,700
Great Britain.....	10,000	9,000	8,000	9,500	7,000	7,300
Italy.....	874	1,473	2,058	1,880	1,929	1,800
Norway.....	2,500	13,319	19,953	21,304	24,429	21,000
Switzerland.....	10,000	12,000	19,000	20,000	20,000	20,000
United States.....	29,500	63,000	68,000	66,000	68,000	72,000
Total.....	78,093	150,000	170,000	183,000	193,000	204,000

(*) The data in this table are as estimated by Robt. J. Anderson.

Table 228.—World Production of Bauxite, 1913 and 1923-1927

(From *The Mineral Industry*, 1927)

(Metric tons)

Country	1913	1923	1924	1925	1926	1927
Austria.....		2,734 (b)	3,000 (b)	4,000 (b)	5,000 (b)	(c)
British Guiana.....		135,712	188,071	197,458	187,000 (b)	160,000 (b)
British India.....	1,203	6,652	23,602	10,232 (c)	(c)	(c)
Dutch Guiana.....		15,839	60,025	85,501	100,000 (b)	170,000 (b)
France.....	309,285	393,628	335,489	406,421	408,600 (b)	553,000 (b)
Germany.....		6,662	3,084	1,767 (b)	15,000 (c)	(c)
Hungary.....		(c)	(c)	(c)	90,500 (b)	250,000 (b)
Italy (e).....	6,953	98,055	140,750	198,000 (b)	5,000 (b)	85,000 (b)
Jugo-Slavia.....		32,631 (b)	30,000	79,010 (b)	150,000 (b)	130,000 (b)
Rumania.....		4,162		(b) 7,000	(c)	(c)
Spain.....						
Ireland.....	8,417	3,504	5,241	5,120 (b)	6,000 (c)	(c)
United States.....	213,675	531,079	352,117	321,622	398,546	326,289
Total.....	539,533	1,230,658	1,141,379	1,316,131	1,375,000	(b)1,688,000

(a) No record of any production prior to 1920 for lower Austria; output of Dalmatia and Istria prior to 1919 are given under Austria in most statistical tables (cf. previous volumes of the *Mineral Industry*.) Starting with 1920, figures for Dalmatia are given under Jugo Slavia, and those for Istria under Italy. (b) Estimated. (c) Data not available. (d) The bauxite deposits in the Bihar Mountains in Rumania were not exploited until war when they were owned by Hungary. (e) Istria included under Italy.

ANTIMONY

No antimony ore has been produced in Canada since 1917. Ores of antimony are known to occur in British Columbia, New Brunswick, Nova Scotia, Ontario, Quebec and the Yukon. The greater part of the Canadian output of refined antimony was produced in the years 1907, 1909, 1915 and 1916 by the Consolidated Mining and Smelting Company of Trail, B.C., as a by-product in the treatment of silver-lead ores. The remainder was from the New Brunswick ores treated locally.

There is an occurrence of stibnite ore and native antimony associated with arsenopyrite, pyrite and galena that was worked at West Gore, Hants county, Nova Scotia, during the war period, the ore being concentrated at the mine to a 38 to 45 per cent antimony content.

No antimony was produced in 1927, but in 1926 1,596 pounds worth \$281, were recovered from silver-lead-bismuth bullion obtained in the treatment of ores from the Cobalt district, exported for refining in the United States.

About 1850, stibnite and small quantities of native antimony were discovered in the slates and quartzites of Prince William, York county, New Brunswick. Attempts to smelt the ore locally failed, and for a time, the crude ore was shipped but this proved unprofitable and work was discontinued in 1890. In 1907 the deposit was re-worked and during the war period the ore was smelted and refined near lake George.

Antimony ores are rare in the province of Ontario, although it has been found in Hastings, Addington and Frontenac counties and with the silver of the Cobalt district. In South Ham, Wolfe county, Quebec, some work has been done on an antimony deposit.

There are several deposits of antimony in British Columbia. In the Bridge river area, Lillooet Mining Division, stibnite occurs in quartz. The ore contains, on the average, 40 to 60 per cent antimony, free from arsenic, zinc and lead; it also carries gold in amount from a trace to one-half an ounce to the ton. A few shipments have been made from a deposit on the north fork of Carpenter creek in the Slocan district.

Antimony has also been found on Graham island, at Tatlayoko lake, Nanaimo district, and in the vicinity of Kamloops lake where it is associated with cinnabar.

In the Yukon territory antimony ores occur on the Carbon and Chieftain Hills near the Wheaton river.

Table 229.—Production of Antimony in Canada, 1886-1927

Year	Antimony ore		Refined regulus		Antimony in silver-lead-bismuth bullion exported	
	Tons	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
1886.....	665	31,490				
1887.....	584	10,860				
1888.....	345	3,696				
1889.....	55	1,100				
1890.....	26½	625				
1891.....	10	60				
1892-1897.....						
1898.....	1,344	20,000				
1899-1904.....						
1905 (a).....	527					
1906 (a).....	782					
1907.....	2,016	65,000	63,850	5,108		
1908 (b).....	148	5,443				
1909.....	35	1,575	61,207	4,285		
1910.....	364	13,906				
1911-1914.....						
1915.....	1,341	81,283	59,440	11,888		
1916.....	885	94,537	107,185	41,823		
1917.....	361	22,000				
1918-1924.....						
1925.....					1,751	206
1926.....					1,596	281
1927.....						

(a) As recorded by the Nova Scotia Department of Mines: no value given.

(b) Exports.

Table 230.—Imports of Antimony into Canada, 1925-1927

	1925		1926		1927	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Antimony, or regulus of.....	897,298	124,394	1,139,748	183,127	1,284,483	143,446
Antimony salts.....	36,263	6,838	31,056	6,697	37,975	8,233
Antimony salts for dyeing.....	6,834	1,507	3,712	1,047	14,734	2,533
Total.....		132,739		190,871		154,212

Table 231.—Monthly Average Prices of Antimony, 1925-1927

(Compiled from quotations given in the *Engineering and Mining Journal*—"Ordinaries" stand for Hungarian, Chinese or other "Foreign" brands)

(At New York in cents per pound)

Month	1925	1926	1927
	Ordinaries	Ordinaries	Ordinaries
January.....	17.428	23.490	13.910
February.....	19.795	21.676	14.509
March.....	15.553	19.703	12.801
April.....	12.553	17.462	14.166
May.....	15.770	12.170	12.975
June.....	16.500	11.106	12.447
July.....	17.779	14.490	11.880
August.....	17.683	15.957	11.826
September.....	17.143	15.325	11.073
October.....	18.029	13.943	11.165
November.....	20.000	13.385	10.763
December.....	21.692	13.142	11.195
Average.....	17.494	15.988	12.393

World Production of Antimony.—China is by far the greatest antimony-producing country in the world, and as consumption of antimony in that country is only 1 per cent of its production, large quantities are available for export. There are many valuable deposits in the various provinces of China, but in the province of Hunan alone there is said to be 2,000,000 tons, much of which has not been developed. It is estimated that China produced about 19,500 tons of antimony metal in 1927.

Table 232.—World Production of Antimony, 1913 and 1923-1927(From *The Mineral Industry*, 1927)

(Metric tons, antimony content of metal, crude, oxide, or ore)

Country	1913	1923	1924	1925	1926	1927
United States.....		9	33	33	24	
Canada.....				1	1	
Mexico.....	2,340	490	775	1,399	1,200	
Bolivia (a).....	30	312	751	1,850	1,568	
Peru.....						
Hungary.....		643	348	400	422	
Austria.....	1,038					
Austria-Hungary.....	840					
Germany.....						56
France.....	5,170	864	873	795	910	
Italy.....	360	271	465	390	30	
Portugal.....	10					
Spain.....		41				
Jugo-Slavia.....		131	414	350	275	
Serbia.....	250					
Algeria (a).....	186	500	236	880	840	
British South Africa.....	30			18	30	
China (a).....	13,032	14,244	(b) 13,168	19,040	28,848	
Japan.....	20					
India.....						
Indo-China.....				50		
Asia Minor.....	240	400	400	400	400	
Victoria.....	960	527	163	97		
New South Wales.....	10					
Queensland.....					10	
Western Australia.....						
Total.....	24,516	18,432	17,626	25,703	34,614	

Not available.

(a) Exports

(b) Statistics of Hunan Antimony Association

CHROMITE

There has been no production of chromite in Canada since 1923 when 3,558 tons valued at \$52,650 were produced.

The mineral chromite (FeO , Cr_2O_3) is the commercial source of the metal chromium, which is of prime importance in the manufacture of chrome steel armour plate and other similar steels. Chromium is a necessary constituent of many high-speed cutting tools, and, in the manufacture of stainless steels, where it makes up from 12 to 14 per cent of the alloy, its use is well established.

Quebec has been the main source of chromite ore in Canada. Rhodesia, India, and New Caledonia, supply over 90 per cent of the world's chromite.

During the war when the higher grades of ore from other continents were not easily obtainable, many low-grade deposits in Canada and the United States were opened up, and for a time considerable metallurgical research was done in Canada on the reduction of chromium-bearing ores. Chromium metal may be obtained from chromium oxide by reduction with aluminium. The metal made in this manner is very pure and free from carbon. In less pure form, it has been made in the electric furnace directly from the ore. The resultant product made in this manner contains small percentages of iron and carbon but not enough to cause any serious trouble when the metal is used in alloys with other metals. Ferrochrome, also a product of the electric furnace, is made from a good grade of chromite ore, and the iron chromite alloy runs about 60 to 70 per cent chromium. This alloy can then be added in the required amounts to a bath of molten steel. Ferrochrome requirements take about 40 per cent of the world's supply of chromite; about 35 per cent of the chromite produced is used in the manufacture of chromite refractories such as brick and other furnace linings, and 25 per cent is used in the manufacture of chemicals.

Considerable research on the plating of chromium has resulted in much success. Because it does not tarnish readily and as chromium plate has a brilliant blue-white lustre, the use of chromium as a plating material has been greatly extended in recent years.

Table 233.—Production of Chromite in Canada, 1886-1927

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1886.....	60	945	1909.....	2,470	26,604
1887.....	38	570	1910.....	299	3,734
1888-93.....					
1894.....	1,000	20,000	1911.....	157	2,587
1895.....	3,177	41,300	1912-13.....		
1896.....	2,342	27,004	1914.....	136	1,210
1897.....	2,637	32,474	1915.....	12,341	179,543
1898.....	2,021	24,252			
1899.....	2,010	21,842	1916.....	(a) 27,517	311,460
1900.....	2,335	27,000	1917.....	(a) 36,725	499,682
			1918.....	21,994	867,122
1901.....	1,274	16,744	1919.....	8,541	228,898
1902.....	900	13,000	1920.....	11,016	251,379
1903.....	3,509	51,129			
1904.....	6,074	67,146	1921.....	2,798	55,696
1905.....	8,575	93,301	1922.....	767	11,503
			1923.....	3,558	52,650
1906.....	9,035	91,859	1924.....		
1907.....	7,196	72,901	1925.....		
1908.....	7,225	82,008			
			1926.....		
			1927.....		
			Total.....	187,727	3,175,543

(a) A portion of this ore was sold to a customs mill in the district and the final shipments of ores and concentrates in 1916 were 15,249 short tons valued at \$310,902 or an average of \$20.39 per ton; and 23,713 tons valued at \$581,796 or an average of \$24.54 per ton in 1917.

Table 234.—Production in Canada, and Imports of Chromite, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....						
Imports.....						
Bichromate of soda.....	816	107,035	892	109,514	1,030	121,209
Bichromate of potash.....	26	4,826	72	10,764	96	15,127
Brick, fire, chrome.....		35,277		50,203		52,565

Table 235.—World Production of Chrome Ore, 1913 and 1923-1927 (a)

(From *The Mineral Industry, 1927*)

(Metric tons)

Country	1913	1923	1924	1925	1926	1927
Brazil (b).....						Not available
Bosnia (e).....	305		305	12,158		
Canada.....		3,228				
Cuba.....		10,587	8,276	11,841		
Greece.....	6,342	14,828	14,327			
Guatemala (b).....						
India.....	5,670	55,115	46,194	38,053		
Japan.....		4,528	5,376	5,815		
New Caledonia (b).....	63,370	23,226	15,292	18,501		
Queensland.....						
Rhodesia.....	63,384	87,702	156,692	123,222	162,713	
Russia.....		(d) 970	(d) 5,138			
Turkey.....	26,374					
Union of South Africa.....			4,572	11,316		
United States.....	259	231	237	110		

(a) From the official reports of the respective countries. (b) Exports. (c) Estimated in part. (d) Fiscal years ending Oct. 1. (e) Jugo-Slavia after 1919.

IRON ORE

Iron ore was first discovered in Canada in the St. Maurice valley, Quebec, as early as 1667, or perhaps before that. Count Frontenac mined some ore there five years later and the samples, tested in France, were found to be of workable quality.

In 1730 M. Franchville was granted a licence by Louis XIV of France together with a subsidy of 10,000 "livres" to work the St. Maurice iron mines. The project contemplated the construction of a blast furnace which apparently was not successful for, in 1735, he surrendered his rights to the government. Some years later another licence and a subsidy were given La Compagnie des Forges which made not only the iron kettles that were needed by the pioneers for making sugar and soap but furnished the French government with cannon for military enterprises. In 1743 the plant again reverted to the government and was operated by the government until the country passed into the hands of the British.

Nova Scotia with its large iron and steel industry is not at present a producer of iron ore. Deposits of iron ore of various kinds are numerous throughout a large part of the province, which ranks next to Ontario in the matter of total production, but the large deposits of high-grade iron ore in Newfoundland owned and operated by the British Empire Steel Corporation, are much more readily accessible and of a higher and more constant grade than the deposits in Nova Scotia and for that reason the local deposits are not now being worked.

In the early days iron ore mining and smelting were carried on to a small extent in New Brunswick but the ore was low-grade and the operations did not prosper for long.

Iron ore was first mined and smelted in the province of Quebec early in the eighteenth century, and from that time until 1883 the industry was carried on almost continuously at Three Rivers in the St. Maurice district. Other furnaces using local ore were operated at Radnor Forges and at Drummondville, the last to shut down being the Drummondville furnace in 1911. The ores used were bog ores, with charcoal for fuel. The output of all the furnaces was small and the industry derived its chief importance from the superior quality of the pig iron made.

Furnaces have also been built at various times and places in attempts to smelt some of the other classes of ore found in the province, but all were short lived, and none of them achieved commercial success.

More iron ore has been produced in Ontario than in any other province to date but at the present time no properties are producing. About 1896 a system of bounties, inaugurated by the Federal and Provincial Governments to encourage the manufacture of iron and steel from native ores, had the desired effect of stimulating the industry and the following year, blast furnaces were erected at various points in the province. Strenuous efforts were made to use Ontario ores as far as possible and thus obtain advantages of the bounties offered.

As a result, iron mining and prospecting for iron ore were stimulated but the grade found was generally low and contained deleterious material to such an extent that it was soon found unprofitable to operate.

In northwestern Ontario about 1899, a deposit of hematite that later developed into the Helen mine, was found and this mine was the main source of Ontario's output for a number of years. It is now worked out and closed down. Ontario has a large supply of low-grade iron ore, but beneficiation processes must be applied to make these ores suitable for commercial use.

Production of iron ore in British Columbia has been almost negligible up to the present time, but the small production has not been caused so much by the lack of ore as by the lack of a market for the ore. Different varieties of iron ore are found in various parts of the province, the most important of which are the magnetite deposits which occur on the islands along the coast. In some deposits the sulphur content is high, which would necessitate a preliminary roasting before charging to the blast furnaces, but the ores are easily mined, are close to tide-water and would supply for some years a small iron-smelting industry if the local demand for the products would justify its establishment.

Table 236.—Shipments of Iron Ore from Canadian Mines, by Provinces, 1886-1927

(Short tons)

Year	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia	Canada
1886.....	44,388			16,032	3,941	64,361
1887.....	43,532		13,404	16,598	2,796	76,330
1888.....	42,611		10,710	16,894	8,372	78,587
1889.....	54,161		14,533		15,487	84,181
1890.....	49,206		22,305	5,000		76,511
1891.....	53,649		14,380		950	68,979
1892.....	78,258		22,690		2,300	103,248
1893.....	102,201		22,076		1,325	125,602
1894.....	89,379		19,492		1,120	109,991
1895.....	83,792		17,783		1,222	102,797
1896.....	58,810		17,630	15,270	196	91,906
1897.....	23,400		22,436	2,770	2,099	50,705
1898.....	19,079		17,873	21,111	280	58,343
1899.....	28,000		19,420	25,126	2,071	74,617
1900.....	18,940		19,000	82,950	1,110	122,000
1901.....	18,619		15,489	272,538	7,000	313,646
1902.....	16,172		18,524	359,288	10,019	404,003
1903.....	40,335		12,035	209,634	2,290	264,294
1904.....	61,293		16,152	141,601		219,046
1905.....	84,952		12,681	193,464		291,097
1906.....	97,820		9,933	141,078		248,831
1907.....	89,839		12,748	207,769	2,500	312,856
1908.....	11,802		10,103	216,177		238,082
1909.....			4,150	263,893		268,043
1910.....	18,134	5,336	4,503	231,445		259,418
1911.....	22	31,120	3,616	175,586		210,344
1912.....	30,857	71,520	1,185	112,321		215,883
1913.....	20,436	86,416	5,102	195,680		307,634
1914.....		4,775		240,079		244,854
1915.....		3,683		394,429		398,112
1916.....			3,209	271,967		275,176
1917.....			17,150	198,152		215,302
1918.....	130		8,159	201,119	2,200	211,608
1919.....			321	195,649	1,200	197,170
1920.....			960	126,912	1,200	129,072
1921.....				58,499	1,010	59,509
1922.....			526	16,190	1,255	17,971
1923.....			69	30,447	243	30,759
1924.....			1,408	44	28	1,480
1925.....			3,978			3,978
1926.....			200			200
1927.....			2,029			2,029
Total.....	1,279,817	202,850	417,962	4,655,712	72,214	6,628,555

Table 237.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1895-1927

Year	To Nova Scotia	To United States	To Great Britain and Europe	Total shipments
	Short tons	Short tons	Short tons	Short tons
1895.....	2,686	.....	.....	2,686
1896.....	17,410	22,798	.....	40,208
1897.....	12,143	33,039	5,651	50,833
1898.....	34,622	.....	78,640	113,262
1899.....	26,311	98,485	214,322	339,118
1900.....	195,507	153,867	14,776	364,150
1901.....	457,064	84,292	279,102	820,458
1902.....	376,322	96,702	341,421	814,445
1903.....	273,283	90,711	287,793	651,787
1904.....	342,710	6,025	298,694	647,429
1905.....	506,819	6,490	255,846	769,155
1906.....	628,152	141,854	213,867	983,873
1907.....	672,561	123,972	167,074	963,607
1908.....	713,772	59,532	200,033	973,337
1909.....	697,068	241,207	171,722	1,109,997
1910.....	808,762	247,336	203,528	1,259,626
1911.....	737,261	207,193	237,009	1,181,463
1912.....	956,458	191,779	183,673	1,331,910
1913.....	1,048,433	229,402	328,086	1,605,921
1914.....	417,409	43,513	172,998	633,920
1915.....	802,128	.....	66,323	868,451
1916.....	1,012,060	.....	.....	1,012,060
1917.....	883,346	.....	.....	883,346
1918.....	848,574	.....	.....	848,574
1919.....	499,972	.....	.....	499,972
1920.....	624,596	.....	36,708	661,304
1921.....	178,519	.....	206,010	384,529
1922.....	311,482	.....	811,845	1,123,327
1923.....	451,483	.....	356,753	808,236
1924.....	174,602	.....	919,968	1,094,570
1925.....	384,795	.....	883,056	1,267,851
1926.....	465,961	.....	503,640	969,601
1927.....	480,757	68,354	946,569	1,495,680
Total.....	16,043,028	2,146,551	8,385,107	26,574,686

Table 238.—Imports into Canada, and Exports of Iron Ore, 1926 and 1927

	1926		1927	
	Quantity	Value	Quantity	Value
	Short tons	\$	Short tons	\$
IMPORTS—				
Iron ore from United States.....	985,222	2,241,435	1,006,355	2,212,896
Iron ore from Newfoundland.....	441,939	441,969	427,682	427,720
Iron ore from Sweden.....	38,554	170,145	32,470	146,159
Iron ore from other countries.....	.....	.....	20,859	88,849
Total.....	1,465,715	2,853,549	1,487,366	2,875,624
EXPORT —Total.....	759	7,436	2,475	12,125

PIG IRON AND FERRO-ALLOYS, STEEL AND ROLLED PRODUCTS

Statistics of pig iron, steel and rolled products, are regarded as belonging to "Manufactures" rather than to "Mining" but the close relation between the mining of iron ore and the production of pig iron and steel justifies the inclusion here of references to these secondary industries. The data given in this section have been taken from the Bureau's annual report on *"Iron and Steel and Their Products in Canada."*

Production of pig iron, steel ingots, direct steel castings and rolled iron and steel products in Canada was valued at \$46,412,717 in 1927, marking an increase of 11 per cent over the value of \$41,883,565 in the previous year. This industry represented a capital investment in Canada of \$96,295,734; afforded employment to an average over the year of 7,396 people to whom there

was paid \$11,809,198 in salaries and wages, and by manufacturing processes added \$27,418,777 to the value of purchased materials which cost \$18,993,940. Analysis of the sales value by provinces showed the distribution to be as follows: Ontario, \$27,769,202; Nova Scotia, \$10,711,608; Quebec, \$6,433,538; Manitoba and British Columbia, \$1,498,369.

(a) *Pig Iron*.—Blast furnace production totalled 709,697 long tons of pig iron, a decline of 6 per cent from the 757,317 tons of 1926. The year's output included 523,701 tons of basic iron, 145,787 tons of foundry iron and 40,209 tons of malleable iron. Disposition of the output, including about 14,789 tons drawn from stock, was as follows: 521,638 tons went to the producing companies' own steel furnaces, and of the balance, 202,848 tons were sold at an average mill price of \$20.96. In 1926 the average mill price was \$21.83. Taking the population of Canada at 9,519,000 persons in 1927, the per capita production of pig iron was 167 pounds, as against 181 pounds in the preceding year, 136 pounds in 1925, an average of 144 pounds in 1924 and 216 pounds in 1923.

Ontario produced 65 per cent of the Canadian output as against 67 per cent in 1926. Nova Scotia accounted for the balance in each year.

Of the 3 companies producing pig iron in 1927, there were 2 located in Ontario and 1 in Nova Scotia. In addition to the 3 producers of pig iron, 2 plants in Ontario produced ferro-alloys as their principal product; these 5 plants employed a monthly average of 969 people and paid \$1,431,729 in salaries and wages. Ferro-alloys were also made in 3 other plants which have been classed in other industrial groups.

(b) *Steel Ingots and Direct Steel Castings*.—During the year 20 plants in Canada reported under the steel ingots and direct steel castings industry; Quebec had 7 plants; Ontario, 6; Manitoba, 3; and 2 in each of British Columbia and Nova Scotia. Total steel furnace and converter production amounted to 907,945 long tons, an increase of 17 per cent over the 776,262 tons reported for 1926. Of this output, 783,580 tons were transferred to the rolling mills of the producing firms, and 34,287 tons of direct steel castings were sold at an average price of \$180 per ton.

This line of production afforded employment to a monthly average of 2,632 people to whom there was paid \$3,702,595 in salaries and wages.

(c) *Iron and Steel Rolled Products*.—Rolling mill sales were valued at \$32,196,118 in 1927, as compared with \$28,375,129 in 1926. During the year 1,047,507 long tons of iron and steel passed through the mills and of this total 968,894 tons came from the producing companies' own plants, and 78,613 tons were purchased.

There were 11 iron and steel rolling mills operated in Canada during 1927 of which Manitoba had 1; Nova Scotia, 2; Quebec, 3; and Ontario, 5. These plants employed an average of 3,795 people each month and paid \$6,674,874 in salaries and wages during the year.

Rolling mill products sold during 1927 included the under-mentioned articles at approximate values as given: iron and steel bars, over 10 million dollars; steel rails, 10 million dollars; railway track equipment, 4.4 million dollars; blooms, billets and slabs, 1.6 million dollars; structural shapes over 1 million dollars; iron and steel rods over 1 million dollars; plates and sheets, 1.9 million dollars; and many other articles including nails and tacks, washers, chains, scrap, horse and mule shoes, etc.

Table 239.—Principal Statistics Pertaining to the Pig Iron and Ferro-Alloys, Steel and Rolled Products Industry in Canada, 1923-1927

Year	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of materials	Selling value of products	Value added by manufacturing
		\$		\$	\$	\$	\$
1923.....	26	82,880,333	5,235	10,816,201	42,929,121	66,070,771	23,141,650
1924.....	29	79,805,201	5,325	7,201,588	*19,410,742	*33,553,443	*14,142,701
1925.....	31	80,757,625	4,946	7,079,099	*15,507,377	*32,909,463	*17,402,086
1926.....	33	86,987,454	6,140	9,054,170	*19,912,723	*41,883,565	*21,970,842
1927.....	36	96,295,734	7,396	11,809,198	*18,993,940	*46,412,717	*27,418,777

*Figures of materials used for 1924-1927 inclusive are of purchased materials only, and for the same years production figures cover sales only. Data for previous years include estimated values for interplant transfers.

Table 240.—Principal Statistics of the Pig Iron and Ferro-Alloys, Steel and Rolled Products Industry in Canada, by Provinces, 1926 and 1927

Province	Year	Number of plants	Capital employed	Number of employees	Salaries and wages	Production
			\$		\$	\$
Nova Scotia.....	1926	4	17,246,123	1,225	1,329,832	8,681,441
	1927	5	25,107,583	1,240	1,707,614	10,711,608
Quebec.....	1926	10	13,189,670	1,670	2,089,629	5,960,338
	1927	10	10,056,862	1,660	2,143,270	6,433,538
Ontario.....	1926	15	55,070,516	2,911	5,166,271	25,614,100
	1927	15	59,352,279	4,101	7,474,972	27,769,202
Canada*	1926	33	86,987,454	6,140	9,054,170	41,803,220
	1927	36	96,295,734	7,396	11,809,198	46,412,717

*Includes data for 4 plants in Manitoba and 1 in British Columbia for 1926, and for 4 plants in Manitoba and 2 in British Columbia for 1927.

Table 241.—Materials Charged to Iron Blast Furnaces in Canada, 1927

Item	Quantity	Cost at furnace
		\$
Imported iron ore..... long tons	1,263,990	4,491,897
Pyrite cinder..... long tons	696	1,482
Mill cinder, scale, slags, etc..... long tons	77,130	164,040
Scrap..... long tons	43,120	490,163
Limestone..... short tons	407,403	566,244
Coke, from Canadian coal..... short tons	310,978	1,473,738
Coke, from imported coal..... short tons	487,825	2,803,858
Other materials.....		2,712
Total		9,994,134

Table 242.—Production of Pig Iron in Canada, by Grades, 1927

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Pig Iron—				
Basic.....	523,701	504,090	18,557	358,356
Foundry.....	145,787	9,871	151,481	3,208,333
Malleable.....	40,209	7,677	32,810	684,103
Total	709,697	521,638	202,848	4,250,792

Table 242a.—Production of Ferro-Alloys in Canada, 1920-1927.

	Long tons		Long tons
1920.....	27,781	1924.....	35,034
1921.....	22,608	1925.....	25,709
1922.....	21,602	1926.....	57,050
1923.....	41,887	1927.....	56,230

Table 243.—Materials Used in the Steel Ingots and Castings Industry in Canada, 1927

Item	Unit of measure	Companies' own production	Purchased materials	
			Quantity	Cost at furnace
(a) Metals:—				\$
Pig iron.....	Long ton	511,724	5,850	169,464
Spiegeleisen and ferromanganese.....	Long ton		7,164	467,952
Ferrosilicon.....	Long ton		3,585	219,302
Other ferro-alloys.....	Long ton		498	117,353
Metals for making alloy steels (nickel, etc.).....	Long ton	2,557	46	41,837
Scrap iron or steel, including old rails not intended for re-rolling.....	Long ton	62,363	261,542	3,612,683
Scrap made and consumed in works reporting.....	Long ton	142,774		
Total metals.....	Long ton	719,418	278,685	4,628,591
(b) Ores:—				
Crude iron ore:—				
Foreign.....	Long ton		57,808	386,642
Calcined, roasted or treated ore:—				
Foreign.....	Long ton		194	6,832
Manganiferous ore:—				
Foreign.....	Long ton		3,494	74,454
Chrome, etc.:—				
Foreign.....	Long ton		202	7,301
Total ores.....	Long ton		61,698	475,229
(c) General materials:—				
Limestone.....	Short ton	37,208	70,436	137,897
Fluorspar.....	Short ton		7,123	92,243
Other fluxing material.....	Short ton	17,894	1,657	111,937
Coke from Canadian coal.....	Short ton	585	1,097	16,132
Coke made in Canada from imported coal.....	Short ton		971	8,742
Imported coke.....	Short ton		315	4,680
Anthracite coal.....	Short ton		1,112	8,575
Bituminous coal.....	Short ton		150	1,500
Charcoal.....	Short ton			
Carbon electrodes.....	Bushel		52,479	12,967
Other materials.....				75,271
Total general materials.....				183,644
Total general materials.....				653,588
Total value of all metals, ores and general materials purchased.....				5,757,498

Table 244.—(x) Products of the Steel Ingots and Castings Industry in Canada, 1927

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Steel Ingots:—				
Basic open hearth.....	868,440	778,440		
Electric or electrically refined.....	708		620	112,033
Direct Steel Castings:—				
Bessemer.....	2,191	66	2,055	464,732
Electric or electrically refined.....	18,402	77	17,818	3,259,646
*Other.....	18,204	4,997	13,794	2,320,673
Total.....	907,945	783,580	34,287	6,157,084

(x) Production figures as given herein do not necessarily represent the total Canadian output; there may be also a small production in other industrial groups.

* Includes basic open hearth direct steel castings.

Table 245.—Materials Used in the Rolled Iron and Steel Products Industry in Canada, 1927

Item	Companies' own make	Purchased materials	
		Quantity	Cost at furnace
	Long tons	Long tons	\$
Steel, crude and semi-finished (ingots, blooms, billets, slabs).....	957,954	50,504	1,148,159
Rails for re-rolling.....	8,335	10,969	147,000
Iron muck and scrap bar.....	1,097	734	13,034
Iron and steel bars.....	1,508		
Iron and steel wire rods.....		886	55,580
Iron and steel scrap.....		13,138	184,790
Axles, scrap.....		2,382	53,850
All other materials.....			51,377
Total.....			1,653,790

Table 246.—(x) Products of the Rolled Iron and Steel Products Industry in Canada, 1927

Item	Total tonnage made	Tonnage shipped to companies' own plant	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Blooms, billets and slabs.....	984,627	939,605	49,429	1,561,548
Bars—				
Muck and scrap bars.....	9,344	9,344		
Sheet and tinplate bars.....	33,301	33,301		
Bar iron or steel, rolled, whether in coils, bundles, rods or bars, comprising rounds, ovals, squares and flats.....	182,413	27,533	152,651	8,271,415
Reinforced concrete bars (including twisted).....	34,146	974	32,909	1,693,738
Bars, other.....	4,503		4,908	338,629
Rails, open hearth steel.....	235,683	274	234,521	10,494,441
Rods, iron or steel, wire, spike and chain.....	130,721	108,208	24,184	1,040,956
Structural steel, including angles, beams, channels, girders, etc., not assembled or fabricated.....	24,510	533	23,733	1,067,108
Plates and sheets.....	33,219	8,913	24,306	1,864,123
Railway tie plates.....	50,349	6	49,608	2,606,447
Railway track equipment, other.....				1,765,682
Nails and tacks.....				979,235
Washers.....				79,928
Scrap iron or steel.....	68,441	68,441		
All other products.....				50,300
(*) Products of 1 or 2 firms.....				377,568
Total.....				32,196,118

(x) Production figures given in table 8 do not necessarily represent the total Canadian output of the commodities listed; there may also be a small production in other industrial groups.

(*) Includes chains, horse and mule shoes, etc.

Table 247.—World Production of Iron and Steel and Steel Ingots and Castings, 1913 and 1926 and 1927

(In thousands of long tons—2,240 lbs.)

As reported by *Iron Trade Review*

Country	Pig iron			Steel ingots and castings		
	1913	1926	1927	1913	1926	1927
United States.....	30,653	39,373	36,565	31,301	48,294	44,935
Canada.....	1,015	738	730	1,043	777	870
Great Britain.....	10,260	2,441	7,320	7,664	3,497	9,170
France.....	5,126	9,245	9,130	4,614	8,255	8,090
Belgium.....	2,445	3,346	3,690	2,428	3,150	3,640
Luxemburg.....		2,472	2,660		2,208	1,420
Italy.....	420	513	510	919	1,685	1,530
Spain.....	418	460	500	238	615	700
Sweden.....	732	460	470	582	486	480
Germany*.....	19,000	9,491	12,870	18,632	12,147	16,090
Saar Territory*.....		325	400		480	500
Austria*.....	2,344	1,230	1,150	2,585	1,574	1,600
Czechoslovakia*.....		322	570		776	1,350
Poland*.....		157	200		253	210
Hungary.....		2,300	2,920		2,975	3,480
Russia.....	4,563	850	1,200	4,181	1,200	1,550
Japan*.....	236	300	410	300	150	200
China.....	150	902	910	100	450	550
India.....	204	450	410		360	420
Australia.....	47	1,600	1,740		1,700	1,850
Miscellaneous.....	200	300	90	100	200	
Total.....	77,813	77,725	84,445	74,687	91,232	98,635

*Figures for Germany include Luxemburg prior to 1919; figures for Austria prior to 1919 include the major portions of Czechoslovakia and Hungary; Poland's production prior to 1919 is covered in the figures for Germany and Russia; since 1920 Poland's figures include most of Upper Silesia, and the Saar is given separately. Japan's figures include Manchuria and Chosen.

MANGANESE

No manganese has been produced in Canada since 1924 when 584 tons of ore valued at \$4,088 were produced in the province of New Brunswick. Deposits of manganese are also known to occur in Lunenburg county, Nova Scotia, and in British Columbia near the town of Kaslo.

The importance of manganese in the manufacture of iron and steel is steadily increasing. A large part of the consumption is in the manufacture of manganese-iron alloys (spiegeleisen and ferromanganese) for the manufacture of certain steels.

The greatest deposits and the chief sources of manganese up to the present time are in Russia (Caucasus), Southern and Central India and East Central Brazil. It also occurs in commercial quantities in several countries of Europe, Canada, the United States, Mexico, and in Queensland, Australia.

Table 248—Production of Manganese Ore in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	1,789	41,499	1900.....	30	1,800	1913.....		
1887.....	1,245	43,658				1914.....	28	1,120
1888.....	1,801	47,944	1901.....	440	4,820	1915.....	201	9,360
1889.....	1,455	32,737	1902*.....	172	4,062			
1890.....	1,328	32,550	1903.....	91	2,775	1916.....	957	89,544
			1904.....	66	2,740	1917.....	158	14,836
1891.....	255	6,694	1905*.....	22	1,720	1918.....	440	6,230
1892.....	115	10,250				1919.....	661	14,159
1893.....	213	14,578	1906*.....	93	925	1920.....	649	11,029
1894.....	74	4,180	1907*.....	1	22			
1895.....	125	8,464	1908.....			1921.....	68	3,400
			1909.....			1922.....	73	2,044
1896*.....	124	3,975	1910.....			1923.....	200	1,400
1897*.....	15	1,166				1924.....	584	4,088
1898.....	50	1,600	1911.....	6	300	1925-27.....		
1899.....	1,581	20,004	1912.....	75	1,875			
						Total.....	15,185	447,548

*Exports.

Table 249—World Production of High-Grade Manganese Ore 1913 and 1923-1927

(From *The Mineral Industry*)

(Metric tons)

Country	1913	1923	1924	1925	1926	1927
Austria (b).....	16,540			(d)	(d)	(d)
Australia (c).....	27	(l) 2,805	4,838	1,183	1,414	
Bosnia and Herzegovina.....	4,697	(m) 42,043	79,133	(m) 54,054	(d)	
Brazil (e).....	122,300	235,831	159,229	(p) 321,826	(p) 260,143	(p) 246,217
British India.....	828,087	706,210	815,894	852,934	1,031,838	
Canada.....		151	530			
Hungary.....	19,004	403	1,217			
Italy.....	1,622	9,605	12,189	14,984	14,010	9,140
Japan.....	18,039	5,494	7,585	10,317	(d)	
Mexico.....		2,246	1,800			
Panama (a).....		406				
Porto Rico.....		2,799	4,698	(a) 4,260	1,440	
Chile.....	(d)	4,287	4,243			
China (e).....		27,672	38,538	43,260	42,460	
Costa Rica (a).....		(d)	(d)			
Cuba.....	11,589	(e) 19,636	(e) 25,310	(a) 23,757	(a) 14,338	
France.....	7,732	5,993	5,000	4,002	2,625	2,710
Germany.....	330,797	10,245	3,554	144	(d)	
Gold Coast (i).....		(l) 141,875	259,441	362,897	405,194	
Greece.....	556		5,726	4,303	(d)	
Russia and Georgia.....	1,254,658	(l) 413,960	(n) 500,693	(n) 816,507	(n) 1,587,000	
Spain.....	21,594	28,615	20,840	36,072	44,947	
Sweden.....	4,001	5,203	10,885	10,941	15,258	
Tunis and Algeria.....		1,804	3,626	2,105	2,127	
United Kingdom.....	5,480	2,053	2,496	842	30	
United States.....	4,113	32,006	57,422	99,912	47,020	45,487
Total.....	2,650,836	1,701,432	2,024,887	2,664,000	3,469,844	

(a) Exports actually received by the United States in those years. (b) Austria and Hungary combined until 1913 and reported under Austria. (c) Includes New Zealand. (d) Statistics not available. (e) Official statistics of exportation (g) Estimated. (i) Exports. (j) Georgia only. (l) Records of the Imp. Min. Res. Bur. (London). (m) Czechoslovakia. (n) Fiscal year ending Sept. 30. (p) Total production.

MERCURY

During 1926 a small amount of mercury was recovered from a property on the north shore of Kamloops lake, B.C. In 1895, 1896 and 1897 a small production was derived from the same district.

Cinnabar, the principal ore of mercury is found in many countries of the world but the chief producing countries are Italy, Spain and United States in order of their importance. Mercury is used in the amalgamation of gold and silver and as a fulminate in the making of detonators. It also enters largely into the manufacture of drugs, and vermilion (mercuric sulphide) the well-known red pigment. Its increased use in the United States is due to the greater consumption in electrical apparatus such as radios, meters, and storage batteries.

Table 250.—Production of Mercury in Canada, 1895-1927

Year	Flasks	Price per flask	Value
		\$	\$
1895.....	71	33.00	2,343
1896.....	58	33.44	1,940
1897.....	9	36.00	324
1898-1927.....			

Table 251—Imports into Canada of Mercury, 1923-1927

Year	Pounds	Value \$
1923.....	135,953	95,922
1924.....	85,459	60,675
1925.....	146,435	118,697
1926.....	100,492	84,910
1927.....	124,099	100,330

Table 252.—Monthly Average Price of Mercury, 1925-1927

(At New York, per flask of 75 pounds)

Month	1925 \$	1926 \$	1927 \$
January.....	81.596	87.960	101.200
February.....	79.386	87.580	101.727
March.....	80.481	88.194	110.259
April.....	82.327	89.769	123.250
May.....	81.360	91.365	123.900
June.....	83.154	91.246	118.096
July.....	83.077	90.163	119.880
August.....	82.317	89.260	119.111
September.....	81.730	91.425	119.640
October.....	83.856	97.260	126.200
November.....	88.250	99.000	127.708
December.....	90.000	99.510	126.933
Average.....	83.128	91.903	118.159

Table 253.—World Production of Mercury 1913 and 1922-1927

(From *The Mineral Industry*, 1926)

(In metric tons)

Country	1913	1922	1923	1924	1925	1926	1927
Austria.....	819				6		Not available
China (a).....	2	17	2	3	3	(c)	
Czechoslovakia (d).....	89	6	51	78 (b)	80	(c)	
Italy.....	1,004	1,541	1,656	1,641	1,833	1,810	
Mexico.....	166	42	45	37	39	45	
Spain.....	1,245	1,318	1,144	899	1,277 (a)	1,676	
United States.....	670	217	270	343	312	260	
Other countries.....	28	104	104	132	79	(c)	
Total.....	4,023	3,245	3,272	3,133	3,629	.....

(a) Exports. (b) Estimated. (c) Not yet available. (d) Prior to 1919; Hungary.

MOLYBDENUM

Molybdenite deposits are known to occur in Nova Scotia, Quebec, Ontario, Manitoba and British Columbia, but the principal production has come from the Moss Mine near Quyon in Pontiac county, Quebec.

In 1926 the Moss mine at Quyon, Quebec, produced 25,168 pounds of molybdenum concentrates containing 20,943 pounds of molybdenum sulphide which, at 50 cents per pound, was worth \$10,472. There was no production in 1927, although some development work was done on a property in northwestern Quebec during the last half of the year.

The war stimulated the demand for molybdenum ores to an appreciable extent but with the cessation of hostilities, the producers were left with considerable stocks on hand for which

there was no immediate market, owing to the limited uses of the metal. The ore produced was mostly low-grade material carrying less than 2 per cent MoS_2 , but there was some which ran from 2 to 15 per cent MoS_2 , and some higher grade hand-picked material was also produced.

Molybdenum is chiefly used in the manufacture of molybdenum steel for use in automotive construction. The principal producing countries during the last three years were United States, Norway, Australia and Canada.

Table 254.—Production of Molybdenite in Canada, 1902-1927

Year	Ores mined	Ores treated	Ores and concentrates shipped		MoS ₂ content of shipments	MoS ₂ production (probable recovery)	
	Tons	Tons	Tons	Value (a) \$	Pounds	Pounds	Value (b) \$
1902.....	3	.....	3.3	400	(c)	(c)	(c)
1903.....	600	.....	85.0	1,275	(c)	(c)	(c)
1904-1913.....	.....	.....	.....	.....	.....	.....	.....
1914.....	166	.....	16.5	2,063	3,814	3,814	2,063
1915.....	2,242	216	39.0	28,920	29,210	29,210	28,450
1916.....	13,522	9,100	610.0	188,316	156,461	156,461	156,461
1917.....	26,871	22,605	1,554.3	320,006	330,316	288,705	288,705
1918.....	34,030	33,935	461.3	428,807	378,482	378,029	434,733
1919.....	7,280	6,783	46.0	69,203	83,002	83,002	69,203
1920-1923.....	.....	.....	.....	.....	.....	.....	.....
1924.....	700	668	10.0	9,370	18,739	18,739	9,307
1925.....	3,000	2,779	15.3	11,176	22,350	22,350	11,176
1926.....	4,186	4,490	12.6	10,472	20,943	20,943	10,472
1927.....	.....	.....	.....	.....	.....	.....	.....

(a) Value as given by the operators. (b) Estimated at the average market value of molybdenite.

(c) No figures available.

Table 255.—World Production of Molybdenum, 1923-1927

(In 1000 pounds molybdenum content)

(From *The Mineral Industry*, 1927)

Country	1923	1924	1925	1926	1927
Australia, N.S.W.....	12	13	7	.....	.....
Australia, Queensland.....	12	2	4	.....	.....
Australia, Victoria.....	40	48	39	36	.....
Canada.....	.....	11	17	13	.....
Japan.....	.....	.....	.....	.....	.....
Korea.....	.....	.....	.....	.....	.....
Norway.....	46	94	159	150	.....
Spain.....	.....	.....	.....	.....	.....
Sweden.....	.....	.....	.....	.....	.....
United States.....	.....	297	1,154	1,371	2,150
All other countries.....	.....	.....	.....	.....	.....
Total.....	110	465	1,380	1,570	2,150

TIN

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important perhaps being the discovery of cassiterite, near New Ross, Lunenburg county, N.S. Reports upon it may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines for 1907, 1908, 1910, 1911 and 1912.

Cassiterite occurs in a few scattered crystals in pegmatite dykes in the drainage basin of McDougal creek, Lardeau division, B.C., and it has been found also in black sands in the Atlin district, B.C., and in the alluvial sands of Dublin gulch, Mayo district, Yukon.

Tin is also found in Sullivan mine ore which is primarily lead and zinc. It has been separated by the Consolidated Mining and Smelting Company, Limited, but up to the present, the work has been only experimental and there has been no commercial production of the metal from this source.

An occurrence of tin has been noted in some bodies of sulphide minerals found in the vicinity of West Hawk and Star Lakes, near the boundary line between Ontario and Manitoba.

Ores of tin were formerly imported from South America and reduced in Canada by the Electro Tin Products Company at Brantford, Ontario. The plant, which consisted of roasting furnaces, electric smelting and slag-cleaning furnaces, was dismantled some years ago when competition of European smelters treating the easily-reducible tin concentrates from the Malay States, made the operation of the Canadian plant (and several in the United States) unprofitable.

Table 256.—Imports into Canada of Tin, 1925-1927

	1925		1926		1927	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Tin in blocks, pigs and bars.....	4,396,100	2,459,830	5,107,900	3,263,513	4,833,800	3,036,082
Tin foil.....	558,997	222,657	304,242	179,265	154,622	77,914
Strip waste.....	1,000	38	498,200	3,139	4,000	66
Collapsible tubes.....		27,500		43,318		82,179
Dairy tin.....		64,990		80,716		69,279
Tinware, etc. (a).....		593,579		685,655		638,405
Tin cans and containers.....		679,718		666,281		673,173
Bichloride of tin or tin crystals.....	149,301	46,671	223,913	76,081	415,705	147,323
Total.....		4,094,983		4,997,968		4,754,421

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin, n.e.s.

(b) Included with "Bichloride of Tin".

Table 257.—World Production of Tin (a) 1915 and 1923-1927

(From *The Mineral Industry* 1927)

(Long tons)

Country	1915	1923	1924	1925	1926	1927
Australia.....	5,836	3,283	3,069	3,016	2,915	(e) 2,625
Bolivia (b).....	21,544	29,777	31,553	32,083	30,543	36,383
China.....	7,995	(d) 8,727	(d) 6,858	(d) 8,789	(d) 6,477	(d) 6,072
Congo (b).....	28	496	483	(e) 600	1,200	(e) 1,200
Dutch East Indies.....	19,255	29,138	31,558	32,749	33,006	33,411
Federated Malay States (b).....	46,765	37,649	44,043	45,925	45,946	52,176
Great Britain.....	4,968	1,021	1,986	2,339	2,327	2,593
India.....	430	1,405	1,375	1,323	2,413	2,361
Japan.....	336	300	341	350	.....	.....
Nigeria.....	4,837	5,912	6,162	6,186	7,042	7,710
Portugal and Spain.....	293	(e) 100	(e) 100	(e) 100	(e) 100	.....
Siam (c).....	8,998	7,684	7,793	6,802	6,978	7,435
Unfederated Malay States (b).....	3,040	1,727	2,870	2,145	1,842	2,143
United States.....	91	2	6	12	7	24
Union of South Africa.....	2,056	884	1,150	1,142	1,275	1,300
Other countries (e) (f).....	400	900	1,100	1,200	800	800
Total.....	126,872	129,005	140,447	144,761	142,871	156,233

(a) Tin content of ore.

(b) Exports. (c) Fiscal years ending March 31, of succeeding calendar year.

(d) Shipments to Europe, Asia, and the United States. (e) Estimated.

(f) Includes data for French Indo-China, Germany, Swaziland, etc.

TUNGSTEN

Tungsten ores are found in several very widely separated districts in the Dominion, notably, in the provinces of Nova Scotia, New Brunswick, Manitoba and British Columbia. Deposits in Nova Scotia and New Brunswick are the most important. In 1927 some intensive prospecting was done at the Indian Path mine, Lunenburg county, Nova Scotia, which resulted in the showing up of a wide zone of slate carrying stringers of quartz and scheelite.

The only important productions⁽¹⁾ of tungsten ore in Canada reported, are the following:

In 1912 there was a shipment of 14 tons of concentrates produced by the Scheelite Mines, Ltd., of Moose River, N.S.

In 1917 a small test shipment of a few hundred pounds was made from Halifax county, N.S., and another from Dublin gulch, Mayo district, Y.T., amounting in all to 580 pounds, running 69.41 per cent WO₃ and netting \$234.

The production in 1918 amounted to 13½ tons valued at \$11,700 and with a metallic content of 19,915 pounds of WO₃. This production consisted of 11 tons of concentrates shipped to New York by the Acadia Tungsten Mines, Limited, operating at Burnt Hill, N.B., with also a few small consignments to the Mines Branch testing plant, Ottawa, from Nova Scotia, Manitoba, and the Mayo district, Yukon.

China is the world's greatest producer of tungsten and in 1927 the production from this country amounted to about 60 per cent of the world's output of tungsten concentrates. Practically the whole of the Chinese ore was exported, Germany being the chief purchaser. Germany was also the greatest consumer in 1927, followed closely by Great Britain and the United States which used about equal amounts.⁽²⁾

(1) Mines Branch report, 1920.

(2) The Mineral Industry, 1927.

Table 258.—World Production of Tungsten (a) 1917, and 1923-1927

(Metric tons; 60 per cent WO₃ concentrates)

(The Mineral Industry, 1927)

Country	1917	1923	1924	1925	1926	1927
NORTH AMERICA—						
United States.....	5,574	220	512	1,080	1,254	1,230
Mexico.....	308	*30	*25	*25	*25	*25
SOUTH AMERICA—						
Argentina.....	1,085	139	132	4	*150	*85
Bolivia.....	4,215	38	18	75	60	*140
Peru.....	427			5	18	
EUROPE—						
England.....	255	2	2	2	20	*35
France.....	261			150	*110	*100
Portugal.....	1,580	300	305	207	*400	*500
Saxony-Bohemia.....	295	100	*83	170	*50	*50
Spain.....	446	28	200	40	*50	*50
ASIA—						
Burma.....	4,226	959	813	850	1,900	2,040
China.....	1,361	4,000	3,000	7,000	8,000	*8,000
Federated Malay States.....	837	44	105	171	163	24
Unfederated Malay States.....	334	81	325	251	234	*245
French Indo-China.....	433	161	150	189	170	*200
Japan and colonies.....	1,682	*250	1-5	15		
Siam.....	726	25	10	10	10	
AUSTRALASIA—						
New South Wales.....	268	2	10	3		
New Zealand.....	235	5	3	2		
Northern Territory.....	252					
Queensland.....	471		1	5	1	
Tasmania.....	286	107	60	207	91	*85
Total.....	26,000	7,100	6,500	10,000	12,500	13,000

(a) Statistics reported by F. L. Hess and L. M. Jones of the United States Bureau of Mines and by foreign governments.

*Preliminary estimate.

CHAPTER SEVEN

The Non-Ferrous Smelting and Refining Industry in Canada

Co-incident with the expansion in the mining of ores bearing non-ferrous metals, there has been a notable growth in the smelting and refining of such ores in Canada. Abundant water power, advantageously distributed over the Dominion, has made possible the generation of electric energy at such a low price that the use of electrochemical or electrothermic processes has been adopted in many new fields. Among these may be noted the smelting of bauxite ores and the production of aluminium in various forms in Quebec, the refining of nickel and copper in central Ontario, the manufacture of electrolytic lead and zinc in British Columbia. Electric furnaces are also used in the manufacture of abrasives and ferro-alloys, and, in a small way, in the treatment of iron and steel.

As a source of power, electric energy is being used to an increasing extent in the mining and milling fields and important economies in operation are being effected.

In the treatment of ores, the mining and milling operations are so closely associated, that it is impossible to make a separation of the statistics in these two steps. There is less difficulty in drawing a line between mining and milling on the one hand, and smelting and refining on the other. This chapter is devoted to a consideration of the smelting and refining industry in Canada treating the ores of the non-ferrous metals.

The 10 plants operated by the 8 companies included in this group in 1927 were as follows:— 1 plant at Arvida and 1 plant at Shawinigan Falls, Quebec, both operated by the Aluminium Company of Canada, Limited; the smelter at Rouyn, Quebec, operated by the Horne Copper Corporation; the smelter at Coniston, Ontario, operated by the Mond Nickel Company of Canada, Limited; the smelter at Copper Cliff and refinery at Port Colborne, Ontario, operated by the International Nickel Company of Canada, Limited; the smelter and hydrometallurgical works of the Deloro Smelting and Refining Company at Deloro, Ontario; the smelter of the Kingdon Mining, Smelting and Manufacturing Company, Limited, near Galetta, Ontario; the smelter, lead refinery, zinc refinery, precious metals refinery and copper refinery of the Consolidated Mining and Smelting Company at Tadanac, near Trail, B.C.; and the smelter of the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox, B.C.

In Quebec the Aluminum Company of Canada operated their new plant at Arvida steadily throughout the year on the production of aluminium. Smelting of alumina imported from the United States has been carried on at Shawinigan Falls for many years and the construction of the new plant at Arvida by the same company places the province of Quebec in an enviable position as a producer of aluminium metal in its various forms.

In the Horne Copper Corporation, Quebec has another industrial enterprise that has attracted much attention since its formation. Smelter construction, which was commenced early in 1926, was completed and the smelter put in operation on December 16, 1927; treatment of customs ores from the mines of the district will add to the smelter output.

Ontario has 4 smelters and 1 refinery in operation. The Mond Nickel Company Limited operates a smelter at Coniston, Ontario, producing a matte that is then shipped to the refinery operated by the same company at Clydach, Wales, where nickel metal, copper sulphate, gold, silver, and the metals of the platinum group are produced. The International Nickel Company mines and smelts nickel-copper ore at Copper Cliff, Ontario, producing a nickel-copper matte, part of which is shipped to Huntington, West Virginia, U.S.A., where it is made into the alloy known as monel metal, and the remainder is shipped to the company's refinery at Port Colborne, Ontario, where refined and electrolytic nickel, converter copper and sponge platinum are made.

The Deloro Smelting and Refining Company of Deloro, Ontario, treats ores from the districts of Cobalt, South Lorrain and Gowganda and produces refined silver, cobalt metal, cobalt oxides and salts, nickel metal, nickel oxides and salts, white arsenic, various insecticides and stellite, an alloy of cobalt, chromium and tungsten used mainly as a metal cutting tool. The Kingdon Mining, Smelting and Manufacturing Company operates a lead mine, mill and small smelter or Scotch hearth at Galetta, Ontario. As the general statistics given by the last named company were not separated by departments and as mining and milling predominate in this enterprise, data on capital investment, salaries, wages, etc., for this property have been combined with the statistics on silver-lead-zinc mining, but the value of the smelter production has been included with the figures for the other smelters. An estimate was made of the value of the ores smelted and this figure was included in the totals for the silver-lead-zinc mining section, so that the proper adjustments have been made to ensure the comprehensive treatment of mine and smelter statistics.

British Columbia is the only other province in the Dominion in which there are non-ferrous smelting plants in operation. In this province there are 2, one operated by the Consolidated Mining and Smelting Company at Trail, and the other by the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox. The smelter at Trail is the largest non-ferrous metallurgical works in the British Empire. There facilities are provided for the treatment of lead ore and concentrates, zinc ore and concentrates, copper and gold ore and concentrates. This smelter purchases practically all the smelting ore mined in southern British Columbia but its main source of supply is from the famous Sullivan zinc-lead mine at Kimberley, B.C., which is owned by the company. Each year new demands have been made on the capacity of the smelter, which have been met so readily that very little smelting material within reasonable hauling distance is now sent elsewhere. This company also operates a concentrator to which mining companies that have no mill may send their ore.

In the northern part of the province there is the copper smelter of the Granby Consolidated Mining, Smelting and Power Company Limited, which treats the ore from its own mine, the Hidden Creek, and does some custom work as well. During 1926 and in former years some concentrates from the company's concentrator were shipped to Tacoma, Washington, U.S.A., but a new sintering plant has been installed and the old one has been improved, so that it is now expected the smelter will be able to handle all the concentrates produced by the mill.

Capital invested in the metallurgical plants in Canada, reviewed in this section, amounted to \$85,366,662 in 1927, including \$55,857,236 invested in lands, buildings, plants, machinery and tools; \$19,209,512 in materials on hand, supplies, finished products and ore waiting to be treated; and \$10,299,914 in cash, trading and operating accounts and bills receivable.

There were 7,671 employees including salaried workers and wage-earners engaged in this industry during the year. Salaries and wages reached a total of \$12,120,240. Fuel cost \$6,380,127—including coke worth \$2,166,276; electricity, \$2,655,634; and bituminous coal, \$1,035,840. The total power employed was 172,182 h.p., comprising 12,765 h.p. generated by steam engines and steam turbines; 123 h.p. from gasoline, oil and gas engines; 64,435 h.p. supplied by hydraulic turbines and water wheels; and 94,859 h.p. by electric motors which were operated on purchased power. In addition there were 521 other electric motors in use having a combined rating of 19,506 h.p., which were operated by power generated by the primary power of the industry.

Owing to the difficulty of obtaining separate data on mining, milling and smelting operations, particularly in the case of companies carrying on all three operations at one point, it was necessary in some cases to use estimates for the value of the ores at the mine. In these cases every care was taken to establish fair values. As thus computed, the value of the ore charged to the furnaces in the several smelters amounted to \$32,516,687. Sales from these smelters amounted to \$77,996,265, showing that the value added in converting the ore to saleable products was \$45,479,578.

Table 259.—Ores, Concentrates and Residues Smelted and Value of Smelter and Refinery Products in the Non-Ferrous Smelting and Refining Industry, 1926 and 1927

	1926	1927
	\$	\$
Materials used— Ores, concentrates, residues, etc.....	39,237,657	32,516,687
Products made— Gold, silver, blister copper, refined copper, lead, zinc, nickel, nickel-copper matte, nickel oxide, nickel salts, cobalt, cobalt oxide, cobalt salts, speiss residues, aluminium, base bullion.....	72,853,566	77,996,265

Table 260.—Capital Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY— Lands, buildings, plants, machinery and tools.....	54,976,248	55,857,236
Materials on hand, supplies, finished products, ore in storage.....	17,035,037	19,209,512
Cash, trading and operating accounts, bills receivable.....	9,767,955	10,299,914
Total.....	81,779,240	85,366,662

Table 261.—Employees, Salaries and Wages in the Non-Ferrous Smelting and Refining Industry in Canada, 1926 and 1927

	1926			1927		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female		Male	Female	
			\$			\$
Salaried Employees— Total.....	590	45	1,240,936	584	60	1,551,036
Wage-Earners—						
January.....	5,162		8,344,002	7,461	26	10,569,204
February.....	5,192			7,286	26	
March.....	5,231			6,894	27	
April.....	5,278			6,672	27	
May.....	4,968			6,641	27	
June.....	4,961			6,848	27	
July.....	5,220			6,557	29	
August.....	5,581			6,642	27	
September.....	5,808			6,755	28	
October.....	6,107			6,636	29	
November.....	6,129			6,585	29	
December.....	5,904			6,709	28	
*Average.....	5,591			6,999	28	
Total.....	6,181	45	9,584,938	7,583	88	12,120,240

*See note page 30.

Table 262.—Fuel and Electricity Used in the Non-Ferrous Smelting and Refining Industry in Canada, 1926 and 1927

Item	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal (a) Canadian.....	Ton	139,364	883,568	56,575	384,909
(b) Imported.....	Ton			106,514	650,931
Anthracite coal.....	Ton	285	4,404	133	2,053
Coke.....	Ton	253,130	2,450,301	229,378	2,166,276
Gasoline.....	Imp. gal.	42,180	6,533	28,925	7,653
Kerosene or coal oil.....	Imp. gal.			4,196	1,122
Fuel oil and diesel oil.....	Imp. gal.	3,743,565	357,133	5,498,852	426,123
Wood.....	Cord	5,958	40,273	5,875	43,787
Gas (a) Manufactured.....	M cu. ft.	364,819	50,811	293,038	39,560
(b) Natural.....	M cu. ft.			337	299
Other fuel.....					1,780
Electricity purchased*.....	K. W. H.	876,182,647	2,283,604	1,112,907,760	2,655,634
Total			6,076,627		6,389,127
Electricity generated (a) For own use.....	K. W. H.			262,034,688	
(b) For sale.....	K. W. H.				

*In 1926, the record shows only total electricity used.

Table 263.—Power Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1926 and 1927

	1926		1927	
	Number of units	Total h.p.	Number of units	Total h.p.
Steam engines and steam turbines.....	27	12,855	22	12,765
Gasoline, gas and oil engines.....	1	53	4	123
Hydraulic turbines or water wheels.....	21	64,435	21	64,435
<i>Total primary power</i>	<i>49</i>	<i>77,343</i>	<i>47</i>	<i>77,323</i>
Electric motors run by purchased power.....	1,303	89,017	2,344	94,859
Total power employed	1,352	166,360	2,391	172,182
Electric motors run by primary power in same plant.....	517	19,134	521	19,506
<i>Total electric motors</i>	<i>1,820</i>	<i>108,151</i>	<i>2,865</i>	<i>114,865</i>
Boilers.....	17	5,709	37	11,550

CHAPTER EIGHT

THE COAL MINING, COKE, NATURAL GAS, PEAT AND PETROLEUM INDUSTRIES
(Fuels) IN CANADA

Introduction.....	
The Coal Mining Industry in Canada.....	
1. General Review.....	
2. Commodity Statistics on Coal—including Tables on Output, Disposition, Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption, and World Output.....	
The Coke Industry in Canada.....	
The Peat Industry in Canada.....	
The Petroleum Industry in Canada.....	
1. Production of Crude Petroleum.....	
2. Petroleum Refining.....	

Introduction.—In order to correlate data regarding fuels in Canada, this chapter has been prepared to include statistics of the coal, natural gas, peat and petroleum industries. This survey presents information in detail regarding these industries as a whole, dealing principally with the mineral industry although supplementary data are shown for closely allied manufacturing operations.

Primarily the topic of fuel supply is ever present in the Canadian public mind, and for two main causes, namely; occasional limitation of supplies from other countries, and a growing national appreciation of the value and extent of Canada's own coal resources. Repeated shortages of coal supplies, caused a widespread popular demand for the adoption of measures to prevent the recurrence of such situations. Steps were taken to promote the by-product coking of Canadian coal to meet the need for domestic fuel; investigations were undertaken looking to the preparation of western lignites in such form as would permit their shipment for considerable distances; oil-burning equipment suitable for household heating made its appearance on the Canadian market; and, as a result of the educational program regarding household fuels, there arose a demand for a more extensive use of Canadian coals by railways and industrial concerns.

THE COAL MINING INDUSTRY

1. General Review

CANADA

An historical survey of coal mining in Canada is best made by tracing the growth of this industry through its various stages in each province. In the following provincial reviews, will be found a resumé of the early events in the coal trade of Canada drawn from the official records of the federal, and the several provincial departments of mines.

Official data on the production of coal in Canada show that 16,426,253 tons of coal were produced during the period 1785-1880.

During 1881, the coal production was 1.5 million tons; twenty years later it had risen to 6.48 million tons; and in 1913, a total of 15 million tons was produced. The record annual output for the industry was made in 1927, when 17.4 million tons were raised.

Employment in the coal-mining industry was steady in 1927; the only fluctuation was due to the usual seasonal variation in demand. Following the prolonged strike in Nova Scotia in 1925, the mines in that province worked steadily throughout 1926 and 1927. Time lost in the eastern mines due to strikes amounted to 48,253 working days as compared with a total loss of

26,030 working days in 1926. In Alberta there were 3 labour disputes in which 732 men were involved with a loss of 5,696 working days. In all there were 20 strikes in which 16,580 men participated, losing in the aggregate 54,048 working days. The 1926 total was lower and consisted of 16 strikes, affecting 8,895 men with a consequent loss of 30,135 working days. In 1925 there were 13 disputes, 15,544 men were affected and the total loss in working time amounted to 1,571,859 days. During 1924, there were 15 disputes, 21,214 men were affected and the total loss in working time amounted to 1,555,105 days.

The average number of employees on Canadian coal mine staffs in 1927 increased to 29,772 as compared with an average of 28,368 for the preceding year. Salaries and wages showed an advance of 3.1 millions to \$38,955,967 as compared with \$35,841,796 in 1926. The fluctuations in coal-mine employment corresponded with the seasonal demand for coal. In January, 30,704 wage-earners were employed; the number decreased to 26,255 in April and remained fairly constant until September when 28,129 men were engaged in or about the mines. The increase was gradual during the remaining months and the year closed with a peak employment in December of 31,766 men.

Closely related in point of interest to the number of employees, are the data concerning the number of days' work done and the wages paid. In 1927, excluding the salaried employees, there were 28,357 men working in the coal mines of Canada; of these 6,446 worked on the surface and 21,911 under ground. Surface men worked on the average 278 days during the year; underground men 243 days. The total number of man-days' work done during the year was 7,113,288; this number divided into the total sum of wages paid during the year, showed an average earning power per man of \$5.03 per working day. In 1926 the average computed on the same basis was \$4.97 per day and in 1925 it was \$5.51 per day.

Canada's coal output in 1927 advanced to 17,426,861 tons valued at \$61,867,463, an increase of 948,730 tons in quantity and \$1,992,369 in value over the totals of 16,478,131 tons with a valuation of \$59,875,094 for the preceding year.

Nova Scotia mines produced 7,071,876 tons of coal in 1927 which was a greater tonnage from these mines than in any previous year since 1915 when the output amounted to 7,463,370 tons. These figures furnish a marked contrast to the output of 3,842,978 tons in 1925 but in that year a strike extending over about four months very materially reduced the output.

New Brunswick's coal mines produced 203,950 tons in the year, an increase of 18 per cent over the total of 173,111 tons produced in 1926.

Bituminous coal only is produced in Nova Scotia and New Brunswick. Employment in the coal mines of the maritime provinces was comparatively steady throughout the year, with a slightly upward trend.

In the western field, the province of Alberta is the greatest producer and in 1927 the mines of this province yielded 6,934,162 tons of coal including 3.35 million tons of lignite, 2.98 million tons of bituminous coal and 0.59 million tons of sub-bituminous.

Saskatchewan produced 470,216 tons of lignite. In the prairie provinces there is a seasonal decline in the production of coal during the summer months when many of the small mines are shut down so that their owners may engage in the more profitable industry of growing wheat.

British Columbia, mining bituminous coal only, produced about a quarter of a million tons per month, and in 1927 showed an output of 2,746,243 tons. A large part of British Columbia's coal output goes to export trade, and the balance is used within the province, very considerable quantities being consumed in the metallurgical works and other industrial enterprises.

Canada drew its supply of imported coal in 1927 largely from the United States but also imported 938,840 tons from other countries, including 928,544 tons from Great Britain and the balance, in almost equal amounts, from Germany and the Netherlands, together with a small quantity from Japan.

Development of the coal trade between Canada and Great Britain had its inception during the strike at the anthracite mines in the United States, but the long drawn out strike in British coal mines in 1926 was a retarding factor in this newly developed trade. A feature of the 1927 coal trade was the importation of nearly a million tons of coal from Great Britain. Never before had so great a tonnage been brought to Canada from that source. During the five years 1923-1927, Canada has imported from Great Britain a total of 2.6 million tons of coal, including 2.1 million tons of anthracite and 0.5 million tons of bituminous coal.

A new feature of Canada's import trade in coal in 1926 and 1927 was the receipt of shipments from Germany and the Netherlands. This was nearly all classed as anthracite although it included some briquetted coal.

Exports of Canadian coal were about equally divided between the eastern and western coal fields. In all 1,113,330 tons were shipped to points outside the Dominion. Canada's chief customers are Newfoundland, the Irish Free State, and the United Kingdom, Alaska, points in the United States, Australia, Italy and New Zealand. Smaller quantities are exported each year to a great many other places.

Interest in the production of by-product coke as a domestic fuel has been cultivated in Canada as a part of the educational program inaugurated when a shortage of imported coal supplies became acute.

NOVA SCOTIA

In 1654, a concession was granted by Louis XIV to Nicholas Denys to mine gold, silver, copper and other minerals on the whole of Cape Breton island. A prospectus was published in Paris by Denys during 1672, in which it was stated that coal was to be found throughout the concession near the sea coast. The Intendant of New France, M. Duchesneau, issued a proclamation in 1677, placing a royalty of 20 sous per ton on all coal mined in Cape Breton. Further reference is made to the Cape Breton coal deposits in Admiral Walker's journal in which he states that in 1711 a supply of coal was obtained from the cliffs with the aid of crowbars. But, it was not until 1720 that mining methods were employed in the extraction of coal in this district. In that year it became necessary to obtain fuel for the use of the men engaged in the construction of the fortress of Louisburg. During the succeeding 100 years, little work was done in connection with the mining of coal. In 1724, coal was exported to Boston and in 1728 some shipments were made to Martinique.

Cape Breton became part of Nova Scotia in 1820, and at that time considerable tonnages of coal were being mined. The General Mining Association took over all the mineral rights in the province in 1827. Active mining operations were carried on by this concern in Cape Breton, and in Pictou and Cumberland counties. In 1858 all mineral rights in Nova Scotia were handed over by this Association to the local government, in return the association was permitted to retain the deposits on which work had been commenced. The royalty on slack coal was abolished; a reduction in royalty to 4·80 pence per ton was made on all screened coal sold up to 250,000 tons and to 3·20 pence per ton on sales over this quantity.

Exports to the New England states were very extensive during the period 1854 to 1867, due in the main part to the fact that the United States government had removed the duty on coal in the former year. From 1867 to 1872 a duty of \$1.25 per ton was in force; a reduction to 75 cents per ton was made then and this latter rate continued for 22 years. The period from 1894 to 1897 saw a further reduction in duty to 40 cents a ton which was then increased to 67 cents. Increasing quantities of Nova Scotia coal were shipped to the New England states until in 1903 exports totalled 968,832 tons.

The Dominion Coal Company was incorporated in 1893, taking over the leases of land and sea areas on the south side of Sydney harbour. In 1900 the General Mining Association's mineral rights were taken over by the Nova Scotia Steel and Coal Company.

From 1785 to 1873 inclusive, Nova Scotia produced 8,053,670 tons; in 1874, the production was 972,954 tons; twenty years later it had risen to 2,527,982 tons. The maximum production for the province was reached in 1913 when 7,980,073 tons were shipped; employment was furnished during that year to 13,664 men. In 1927, the total output was recorded at 7,071,876 tons, wage-earners numbered 13,317, including 2,321 surface workers and 10,996 underground.

NEW BRUNSWICK

The discovery of coal in New Brunswick dates back to 1782. Since 1825 the deposit at the head of the Grand Lake, Queens county, has been worked to a limited extent. During 1869, 1870 and 1871, an average production of 22,050 tons was recorded, with a mine value of \$26,600;

twelve men were employed during these three years. The high mark for the industry in this province was reached in 1922 when production totalled 287,513 tons and wage-earners numbered 611 with an average daily wage of \$3.78. Output in 1927 amounted to 203,950 tons. Wage-earners on the mine pay-rolls averaged 558, their earnings averaging \$3.58 per day.

SASKATCHEWAN

The first reference to the occurrence of coal in Saskatchewan is contained in the report of the Palliser expedition in 1857. Investigations were made in the Souris valley by these men on the strength of stories told by Indians and half-breeds. Dr. G. M. Dawson referred to these deposits in 1875; five years later Selwyn conducted boring operations between the Souris valley, Saskatchewan, and Turtle Mountain, Manitoba. D. B. Dowling reported on the Souris valley geology in 1903.

Coal for local consumption is reported to have been mined in the Willow Bunch district about 1872. Shipments on a commercial basis were commenced in 1880 when coal was conveyed by barge to Winnipeg. Production in 1892 totalled 5,400 tons; twelve years later, the output had risen to 124,885 tons; and in 1924 the maximum production of 479,118 tons for the province was reached. During 1927 Saskatchewan mines produced 470,216 tons, which tonnage has only been exceeded in two previous years, namely, 1924 and 1925. Employment was furnished 509 wage-earners in 1927; the average wage per day was \$4.42.

ALBERTA

"The earliest intimation of the occurrence of coal in the area under discussion is probably that which is to be found on a map furnished by Arrowsmith, for Mackenzie's voyages through North America, published in 1801; and a later edition by Arrowsmith published in 1811, on which is shown Peter Fidler's route across the plains, in 1793. These both show that coal had been observed on the Red Deer river, somewhere near the mouth of the Rosebud.

"David Thompson, one of the early pioneers, in 1800 made a trip from the Rocky Mountain House down the Saskatchewan, and noted the coal seams; but his journal is still unpublished. Alexander Henry, trading for the North West Company, records coal at Rocky Mountain House, and mentions seeing in 1811, during his journey down the river, the thick seam near Goose encampment which he estimates at about 30 feet in thickness.

"The coal at Edmonton was noted by Sir George Simpson, in 1841; and ten years later, Sir John Richardson obtained specimens, and considered them to be of the same horizon as the coal on the Mackenzie river.

"Father De Smet crossed the mountains from the westward in 1845, passing Rocky Mountain House. In the foothills, or in the vicinity of the mountains, coal was seen on some of the streams—probably branches of the Red Deer river.

"In 1857, Sir James Hector found coal on Souris river near the present mines. In 1858, he described the coal at Edmonton and also that on the Red Deer river south of Edmonton; remarking that the coal at Edmonton was in use in the forges, and had proved satisfactory. In 1860, he saw the coal seams on the Athabaska and on the Pembina near where the Grand Trunk Pacific railway crosses that stream.

"In 1863, Lord Milton and Dr. Cheadle, recorded the use of coal in the forges at Edmonton, from the seams in the river bank, and also mentioned seeing thick coal seams on the Pembina.

"Dr. Grant in '*Ocean to Ocean*'—the record of Sir Sandford Fleming's trip across the continent in 1872—also refers to the Edmonton and Pembina coals, and to the reported occurrence of vast beds of coal on the Brazeau.

"Discoveries of coal near the International Boundary were made during the progress of the survey of this line. Attached to the commission as a naturalist, was Dr. G. M. Dawson, who reported very fully on the geology of the country, and paid special attention to the evidences of coal underlying the plains. The coal at Roche Percee, discovered in 1857, was fully reported upon, and analyses made. In the vicinity of Milk river, small coal seams were noted for the first time.

"Coal was probably mined at Coal Banks, Belly river, before the advent of the mounted police in 1874. It was then teamed to the barracks at Macleod.

"The coal seams at Blackfoot crossing were recorded by Prof. John Macoun in the report of the Canadian Pacific Railway survey for 1879."¹

¹ Coal Fields of Alberta, by D. B. Dowling, Geological Survey, Canada, No. 44 Geological Series.

Mining was commenced near Medicine Hat in 1883. Two years later the Bow river mine near Cochrane was operated. About 1886, mining on a commercial scale was started at Lethbridge; prior to this date small quantities of coal were obtained from the banks of the river. Coal was discovered near Banff, on the Cascade river, opposite the Bankhead mine in 1888, but, operations ceased here upon the discovery of coal near the railway at Anthracite. The establishment of coal mining at Canmore dates back to 1888.

The first recorded production for this province was for the year 1886, when 43,220 tons were produced. Ten years later, production amounted to 209,162 tons; in 1906, the output had increased to 1,246,360 tons; and in 1920, a total of 6,907,765 tons was reached. Wage-earners engaged in the coal mining industry during 1920 were recorded at 9,640 while in 1927, there were 8,932 men employed and the total output was 6,934,162 tons.

BRITISH COLUMBIA

The discovery of coal in British Columbia dates back to 1835. In that year, samples of coal were brought by the Indians to the Fort McLoughlan post of the Hudson's Bay Company. This coal was found on the northern end of Vancouver island. The next year, the *Beaver*, the first steamboat on the Pacific coast, was supplied with British Columbia coal. Small quantities of coal were extracted from the northern Vancouver deposit during the succeeding years. In 1852 coal was discovered in the Nanaimo area and in the following year over 2,000 tons were produced.

Outcrops of coal were first observed in the Crowsnest Pass coal field in 1858. Local government officials at Fort Steele were advised in 1874 of the occurrence of coal in the Crowsnest pass, but this news created little interest. An excerpt from a report by Robert Strachan, very clearly sets forth the further developments in this district, as follows:

"It was not until 1887 that Mr. William Fernie and Lieut.-Col. Baker commenced to systematically prospect and explore the district. They continued their work for eight years, and during that time were fortunate in interesting others to finance them. They then secured a charter to build a railway, which was accompanied by a grant of certain lands along the side of the railway, and included the rights to the coal.

"The charter required them to build a railway from some point at or about the junction of Summit and Michel creeks to a point on the lower Kootenay river where it joined Goat river. This railway, known as the British Columbia Southern railway, forms the nucleus of the present Crow's Nest Pass branch of the Canadian Pacific railway, and the land which accompanied the charter, with certain modifications, constitutes the holdings of the present Crow's Nest Pass Coal Company comprising about 200,000 acres.

"The Crow's Nest Pass Coal Company became actively interested in this field by acquiring a majority interest in the Fernie-Baker syndicate in the year 1897, and since that time they have played a leading part in the development of the coal industry in eastern British Columbia. Realizing that a railway, as laid down in the charter, provided only one outlet for coal, namely, over the Kootenay river to the Boundary district, the Company at once made an arrangement with the Canadian Pacific Railway Company to extend their branch line, then terminating at Fort McLeod, in Alberta, to the Kootenay river, or to the Kootenay landing on Kootenay lake as it is now termed, in order to enable them to open coal mines at Coal Creek and to build coke ovens at Fernie. The result was that in the following year, when the railway reached Fernie and a branch line extended to the mines, production immediately commenced.

"During that year, 10,000 tons of coal were shipped, and also 361 tons of coke from the coke ovens, which were of the bee-hive type. The following year, coal production had increased to 102,000 tons and over 29,000 tons of coke were made. Since that time the Crow's Nest Pass Coal Company has been a continuous producer of coal and coke, and until 1908 they had the field to themselves.

"In that year, two other companies started operations. The Canadian Pacific railway, who under their arrangement to build the railway, had acquired a block of six square miles, opened a mine at Hosmer, eight miles north of Fernie; and the Corbin Coal and Coke Company commenced operations on an outlying portion of the field, about twenty-four miles east of Fernie. The importance of the district in connection with the development of the interior of the Province will be realized when it is stated that, since the commencement of operations in 1898, over nineteen million tons of coal, or 27 per cent of the total production of the province, has come from this district."

Dawson's report in 1879 referred to the occurrence of coal in the Nicola and Similkameen valleys; nevertheless commercial mining operations did not commence in the former district until 1906 and in the latter until 1910.

From 1836 to 1852, the British Columbia production of coal totalled 11,200 tons; increases were recorded annually until in 1860, an output of 15,957 tons was reached. In 1871, the number of men employed in the coal mines in this province was 194; the value of plant and machinery was \$94,000; and the production amounted to 50,400 tons. Five years later the output had risen to 157,007 tons and in 1901 a total of 1,919,488 tons was produced. The maximum production for the province of 3,330,745 tons was attained in 1910, when 7,758 men were employed of whom 5,903 worked underground. During 1927 employment was furnished 5,038 wage-earners including 1,579 on surface and 3,459 underground; the total output was 2,746,243 tons.

YUKON

There has been a small production of coal annually in the Yukon Territory since 1900. Practically the whole of the output is consumed locally and importations are negligible, consisting only of minor quantities from the United States. In 1927, the coal mine near Carmacks produced 414 tons.

Table 264.—Principal Statistics of the Coal Mining Industry in Canada, 1923-1927

Year	Number of firms	Number of mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Selling value of products
			\$		\$	\$	\$
1923.....	459	507	143,447,448	32,046	46,215,712	4,756,308	72,058,986
1924.....	451	520	146,711,531	27,183	35,123,490	4,358,987	53,593,988
1925.....	450	511	145,006,440	25,032	33,200,309	4,069,634	49,261,951
1926.....	433	457	148,278,315	28,368	35,841,796	4,631,691	59,875,094
1927.....	385	437	146,392,808	29,772	38,955,967	3,558,926	61,867,463

Table 265.—Output, Exports, Interprovincial Shipments, Imports and Coal made Available for Consumption in Canada, by Provinces, 1927

(Short tons)

Province	Canadian coal				Imported from U.S.A.	Imported from Great Britain	Imported from other countries	Coal available for consumption
	Output	Received from other provinces	Shipped to other provinces	Exported				
PRINCE EDWARD ISLAND—								
Anthracite.....					3,814	3,210		7,024
Bituminous.....		85,268			5,050			90,318
Total.....		85,268			8,864	3,210		97,342
NOVA SCOTIA—								
Anthracite.....					29,522	29,864		59,386
Bituminous.....	7,071,876		2,856,984	529,967	37,155			3,722,080
Total.....	7,071,876		2,856,984	529,967	66,677	29,864		3,781,466
NEW BRUNSWICK—								
Anthracite.....					70,468	31,192		101,660
Bituminous.....	203,950	469,774	9,083	‡ 55,354	95,559	17		704,863
Total.....	203,950	469,774	9,083	55,354	166,027	31,209		806,523
QUEBEC—								
Anthracite.....					952,837	709,709	(a) 9,973	1,672,519
Bituminous.....		2,307,185		91	1,572,692	140,267		4,020,053
Lignite.....								
Total.....		2,307,185		91	2,525,529	849,976	9,973	5,692,572
CENTRAL ONTARIO—								
Anthracite.....					2,113,072	10,494		2,123,566
Bituminous.....	*	35			11,663,542			11,663,577
Sub-bituminous.....		1,813						1,813
Lignite.....		22,777		410				22,567
Total.....		24,625		410	13,776,614	10,494		13,811,323
MANITOBA AND HEAD OF LAKES—								
Anthracite.....					95,168			95,168
Bituminous.....		89,922		907	1,638,245			1,727,260
Sub-bituminous.....		75,978						75,978
Lignite.....		682,405		4,580				677,825
Total.....		848,305		5,487	1,733,413			2,576,231
SASKATCHEWAN—								
Anthracite.....					484			484
Bituminous.....		133,510		48	2,141			135,603
Sub-bituminous.....		72,504						72,504
Lignite.....	470,216	1,274,110	228,916	6,247				1,509,163
Total.....	470,216	1,480,124	228,916	6,295	2,625			1,717,754
ALBERTA—								
Bituminous.....	2,984,513	40,854	218,700	409	1,324			2,807,582
Sub-bituminous.....	596,155		183,577					412,578
Lignite.....	3,353,494	73	1,852,203	176				1,501,188
Total.....	6,934,162	40,927	2,254,480	585	1,324			4,721,348
BRITISH COLUMBIA—								
Anthracite.....					46	3,766		3,812
Bituminous.....	2,746,243	51,347	93,128	498,782	22,292	25	(b) 323	2,228,320
Sub-bituminous.....		33,282						33,282
Lignite.....		101,754		16,358	10,829			96,225
Total.....	2,746,243	186,383	93,128	515,140	33,167	3,791	323	2,361,639
YUKON—								
Bituminous.....	414			1	8			421
Total.....	414			1	8			421
CANADA—								
Anthracite.....					3,265,411	788,235	(a) 9,973	4,063,619
Bituminous.....	13,006,996	3,177,895	3,177,895	1,085,559	15,038,008	140,309	(b) 323	27,100,077
Sub-bituminous.....	596,155		183,577					596,155
Lignite.....	3,823,710	2,081,119	2,081,119	27,771	10,829			3,806,768
Total.....	17,426,861	5,442,591	5,442,591	1,113,330	18,314,248	928,544	10,296	35,566,619

(a) Includes 5,155 tons from the Netherlands and 4,818 tons from Germany.

(b) Imported from Japan.

* Includes all coal shipped to any point in Ontario from Western Mines.

‡ Includes 11 tons of Saskatchewan lignite shipped through Saint John, N.B.

Table 266.—Capital Employed in the Coal Mines of Canada, by Provinces, 1926 and 1927

Province	1926				1927			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	45,313,364	2,850,987	6,148,651	54,313,002	46,918,464	3,444,755	6,758,456	57,121,675
New Brunswick....	1,357,866	24,623	305,620	1,688,109	1,401,391	30,747	94,326	1,526,464
Saskatchewan.....	3,630,888	57,918	220,708	3,999,514	3,600,898	46,940	141,233	3,789,071
Alberta.....	47,302,986	1,049,581	7,724,990	56,077,557	46,611,981	1,072,809	7,759,852	55,444,642
British Columbia..	29,138,472	802,609	2,146,252	32,087,333	25,409,332	845,139	2,053,485	28,307,956
Yukon.....	202,500	300	.....	202,800	203,000	.....	.....	203,000
Canada.....	126,946,076	4,786,018	16,546,221	148,278,315	124,145,066	5,440,390	16,807,352	146,392,808

Table 267.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces, 1927

Province	Average number of employees				Salaries and wages			
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Under-ground		\$	\$	
Nova Scotia.....	479	35	2,321	10,996	13,831	1,023,809	15,676,318	16,700,127
New Brunswick....	27	2	123	430	587	50,968	570,043	621,011
Saskatchewan.....	34	2	113	396	545	71,060	482,022	553,082
Alberta.....	549	32	2,304	6,628	9,513	1,371,969	12,166,567	13,538,566
British Columbia..	239	16	1,579	3,459	5,293	650,871	6,910,810	7,561,681
Yukon.....	.....	.....	1	2	3	.....	1,500	1,500
Canada.....	1,328	87	6,446	21,911	29,772	3,148,677	35,807,290	38,955,967

Table 268.—Wage-Earners in the Coal Mines of Canada by Months and by Provinces, 1926 and 1927

Month and year		Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
January.....	1926	11,495	605	650	10,538	5,602	.....	28,890
	1927	13,473	551	706	10,790	5,184	.....	30,704
February.....	1926	10,520	580	614	9,664	5,506	.....	26,884
	1927	13,480	571	654	10,175	5,198	.....	30,078
March.....	1926	9,571	616	537	8,318	5,178	.....	24,220
	1927	13,351	603	524	8,604	5,116	.....	28,198
April.....	1926	11,623	591	366	7,045	4,805	.....	24,430
	1927	13,227	552	352	7,080	5,044	.....	26,255
May.....	1926	12,502	536	335	6,195	4,927	.....	24,496
	1927	12,922	541	316	6,782	4,873	.....	25,434
June.....	1926	12,505	530	286	6,511	4,847	.....	24,679
	1927	13,285	528	300	6,925	4,844	.....	25,882
July.....	1926	12,615	513	271	6,463	4,809	2	24,673
	1927	13,227	543	297	7,477	4,757	3	26,304
August.....	1926	12,515	522	241	7,583	4,886	2	25,749
	1927	13,184	552	327	8,409	4,811	2	27,285
September.....	1926	12,501	489	388	9,057	4,918	2	27,355
	1927	13,273	541	432	8,916	4,964	2	28,129
October.....	1926	12,844	498	568	10,193	5,128	.....	29,231
	1927	13,469	582	662	9,576	5,114	.....	29,403
November.....	1926	13,089	522	698	11,114	5,264	.....	30,687
	1927	13,424	551	789	10,808	5,268	.....	30,540
December.....	1926	13,420	541	694	11,323	5,273	.....	31,251
	1927	13,496	590	740	11,647	5,293	.....	31,766
Average.....	1926	12,100	544	470	8,667	5,095	2	26,878
	1927	13,317	558	509	8,932	5,038	3	28,357

Table 269.—Wage-Earners, Days' Work Done by Months, and Wages Paid in the Coal Mines of Canada, 1927

Month	Number of wage earners			Days' work done			Total wages
	Surface	Under-ground	Total	Surface	Under-ground	Total	
January.....	6,825	23,879	30,704	157,139	466,759	623,898	Monthly records not available
February.....	6,610	23,468	30,078	141,524	414,338	555,862	
March.....	6,400	21,798	28,198	148,381	437,066	585,447	
April.....	6,086	20,169	26,255	135,609	390,783	526,392	
May.....	5,980	19,454	25,434	137,812	399,870	537,682	
June.....	5,987	19,895	25,882	150,417	447,437	597,854	
July.....	6,036	20,268	26,304	131,316	389,529	520,845	
August.....	6,249	21,036	27,285	143,132	426,815	569,947	
September.....	6,420	21,709	28,129	143,568	422,813	566,381	
October.....	6,741	22,662	29,403	157,816	469,300	627,116	
November.....	6,894	23,946	30,840	167,189	515,809	682,998	
December.....	7,129	24,637	31,766	176,721	542,145	718,866	
Total.....				1,790,624	5,322,664	7,113,288	35,807,290
Average.....	6,446	21,911	28,357	278 days per year	243 days per year	251 days per year	\$5.03 per day

Table 270.—Wage-Earners in the Coal Mines of Canada, by Classes and by Provinces, 1927

Classification	Province						Canada		
	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Surface	Under-ground	Total
SURFACE—									
Administration.....	79	14	10	96	32	—	208	23	231
Foremen and clerks.....	145	16	11	222	126	—	510	10	520
Screenmen and loaders.....	647	24	29	620	184	—	1,489	15	1,504
UNDERGROUND—									
Officials.....	455	11	14	322	153	—	10	945	955
Hand cutters and helpers.....	1,764	370	231	2,328	1,584	2	1	6,278	6,279
Machine cutters.....	1,810	3	17	401	46	—	—	2,277	2,277
Machine loaders and helpers.....	1,341	15	54	1,441	89	—	—	2,940	2,940
Horse haulage employees.....	811	—	36	704	395	—	29	1,917	1,946
Mechanical haulage employees.....	1,624	8	10	353	359	—	75	2,279	2,354
Ventilation employees.....	361	—	2	95	48	—	4	502	506
Roadmakers.....	308	4	16	183	94	—	8	597	605
Timbermen.....	779	18	8	319	189	—	15	1,298	1,313
Pumpmen.....	115	2	8	46	43	—	9	205	214
MISCELLANEOUS—									
Enginemen.....	216	12	10	161	84	—	461	22	483
Firemen.....	152	5	11	121	62	—	351	—	351
Machinists.....	235	1	2	72	68	—	370	8	378
Carpenters and masons.....	112	3	10	63	82	—	269	1	270
Other mechanics.....	262	—	6	103	115	—	311	178	489
All other white employees.....	2,101	49	24	1,282	803	—	2,062	2,197	4,259
Japanese.....	—	—	—	—	56	—	1	55	56
Chinese.....	—	—	—	—	418	—	256	162	418
Indians.....	—	—	—	—	8	1	7	2	9
Total.....	13,317	558	509	8,932	5,038	3	6,446	21,911	28,357

Table 271.—Fuel and Electricity Used in the Coal Mining Industry in Canada by Kinds, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
Bituminous coal (Canadian).....	Ton	796,254	\$ 2,747,603	873,273	\$ 3,040,740
Lignite coal (Canadian).....	Ton	151,414	146,845	156,484	111,025
Gasoline.....	Imp. gal.	—	—	6,315	1,979
Kerosene.....	Imp. gal.	—	—	1,861	526
Electricity purchased.....	K.W.H.	114,542,882	1,737,243	24,419,359	404,656
Total		—	4,631,691	—	3,558,926
ELECTRICITY GENERATED*—					
(a) For own use.....	K.W.H.	—	—	100,303,703	—
(b) For sale.....	K.W.H.	—	—	2,493,785	53,513

*In 1926, the record shows only total electricity used.

Table 272.—Power Employed in the Coal Mines of Canada, by Provinces, 1927

Description	Nova Scotia		New Brunswick		Saskatchewan		Alberta		British Columbia		Canada	
	No. of units	Total h.p. rated	No. of units	Total h.p. rated	No. of units	Total h.p. rated	No. of units	Total h.p. rated	No. of units	Total h.p. rated	No. of units	Total h.p. rated
Steam engines and turbines.....	90	45,548	16	933	23	1,535	238	31,822	101	20,815	468	100,653
Gasoline, gas and oil engines.....	3	26	—	—	—	—	42	288	—	—	45	314
Hydraulic turbines or water wheels.....	—	—	—	—	—	—	—	—	3	12,030	3	12,030
Total primary power	93	45,574	16	933	23	1,535	280	32,110	104	32,845	516	112,997
Electric motors run by purchased power.....	132	3,433	—	—	10	73	417	16,094	4	535	563	20,135
Total power employed ...	225	49,007	16	933	33	1,608	697	48,204	108	33,380	1,079	133,132
Electric motors run by primary power in same plant.....	308	27,089	24	373	11	260	304	8,018	246	16,365	893	52,105
Total electric motors	440	30,522	24	373	21	333	721	24,112	250	16,900	1,456	72,240
Boilers.....	158	42,524	19	1,165	12	1,834	192	24,563	93	15,436	474	85,522

2.—Commodity Statistics on Coal

Including Tables on Output, Disposition Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption and World Production

Table 273.—Output of Coal from Canadian Mines, 1785-1927

Year	Short tons	Value	Average per ton	Year	Short tons	Value	Average per ton
		\$	\$			\$	\$
1785-1880.....	16,426,253	28,190,518	1.72	1905.....	8,667,948	17,520,263	2.02
1881.....	1,537,106	2,688,621	1.75	1906.....	9,762,601	19,732,019	2.02
1882.....	1,848,148	3,248,446	1.76	1907.....	10,511,426	24,381,842	2.32
1883.....	1,818,684	3,109,635	1.71	1908.....	10,886,311	25,194,573	2.31
1884.....	1,984,959	3,593,831	1.81	1909.....	10,501,475	24,781,236	2.36
1885.....	1,920,977	3,417,807	1.78	1910.....	12,909,152	30,909,779	2.39
1886.....	2,116,653	3,759,840	1.77	1911.....	11,523,388	26,467,646	2.34
1887.....	2,429,330	4,388,206	1.81	1912.....	14,512,829	36,019,044	2.48
1888.....	2,602,552	4,674,140	1.80	1913.....	15,012,178	37,334,040	2.49
1889.....	2,658,303	4,894,287	1.84	1914.....	13,637,529	33,471,801	2.45
1890.....	3,084,682	5,676,247	1.84	1915.....	13,267,023	32,111,182	2.42
1891.....	3,577,749	7,019,425	1.96	1916.....	14,483,395	38,817,481	2.68
1892.....	3,287,745	6,363,757	1.94	1917.....	14,046,759	43,199,831	3.08
1893.....	3,783,499	7,359,080	1.95	1918.....	14,977,926	55,192,896	3.68
1894.....	3,847,070	7,429,468	1.93	1919*.....	13,919,096	55,622,670	3.99
1895.....	3,478,344	6,739,153	1.94	1920*.....	16,946,764	82,496,538	4.86
1896.....	3,745,716	7,226,462	1.93	1921*.....	15,057,493	72,451,656	4.81
1897.....	3,786,107	7,303,597	1.93	1922*.....	15,157,431	65,518,497	4.32
1898.....	4,173,108	8,224,288	1.97	1923*.....	16,990,571	72,058,986	4.24
1899.....	4,925,051	10,283,497	2.09	1924*.....	13,638,197	53,593,988	3.93
1900.....	5,777,319	13,742,178	2.38	1925*.....	13,134,968	49,261,951	3.75
1901.....	6,486,325	12,699,243	1.96	1926*.....	16,478,131	59,875,094	3.63
1902.....	7,466,681	15,210,877	2.04	1927*.....	17,426,861	61,867,463	3.55
1903.....	7,960,364	15,942,833	2.00				
1904.....	8,254,595	16,592,231	2.01	Total.....	422,236,772	1,227,639,243	.....

*For the years 1919-1927 the tonnage shown is the total output from all mines: for previous years the tonnage shown includes only sales, colliery consumption, and coal used by the operators.

Table 274.—Output and Value of Coal in Canada by Kinds and by Provinces, 1925-1927

(Short tons)

Province	1925			1926			1927		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value	Number of mines	Quantity	Value
			\$			\$			\$
NOVA SCOTIA (Bituminous).....	47	3,842,978	15,826,680	43	6,747,477	26,845,226	40	7,071,876	27,194,671
NEW BRUNSWICK (Bituminous).....	16	208,012	815,367	11	173,111	710,245	14	203,950	885,038
SASKATCHEWAN (Lignite).....	55	471,965	870,875	53	439,803	819,805	55	470,216	868,867
ALBERTA—									
Bituminous.....	19	2,145,635	8,423,909	16	2,858,456	9,984,386	17	2,984,513	10,369,280
Sub-bituminous.....	27	570,654	1,731,267	23	489,736	1,458,116	24	596,155	1,784,973
Lignite.....	307	3,152,742	9,866,308	277	3,155,513	9,443,601	251	3,353,494	9,827,805
Total.....	353	5,869,031	20,021,484	316	6,503,705	20,886,108	292	6,934,162	21,982,058
BRITISH COLUMBIA (Bituminous).....	39	2,742,252	11,720,373	33	2,613,719	10,612,915	35	2,746,243	10,934,777
YUKON (Bituminous).....	1	730	7,172	1	316	800	1	414	2,052
CANADA—									
Bituminous.....	122	8,939,607	36,793,501	104	12,393,079	48,153,572	107	13,006,996	49,385,818
Sub-bituminous.....	27	570,654	1,731,267	23	489,736	1,458,116	24	596,155	1,784,973
Lignite.....	362	3,624,707	10,737,183	330	3,595,316	10,263,406	306	3,823,710	10,696,672
Total.....	511	13,134,968	49,261,951	457	16,478,131	59,875,094	437	17,426,861	61,867,463

Table 275.—Disposition of Coal from Canadian Mines, 1926 and 1927

(Short tons)

	1926			1927		
	Total coal	Total value	Average value per ton	Total coal	Total value	Average value per ton
		\$	\$		\$	\$
Supplied to employees for domestic consumption.....	189,934	634,524	3.35	201,299	672,398	3.34
Used for power purposes—						
(a) Shops.....	4,009	14,410	3.59	10,503	36,344	3.46
(b) Colliery boilers.....	874,006	2,617,642	2.99	939,248	2,808,909	2.99
(c) Companies' railroads.....	69,139	260,829	3.77	78,436	298,706	3.80
(d) Harbour tugs and dredges.....	514	1,567	3.04	1,570	7,806	4.91
Shipped—						
(a) Ships' bunkers.....	727,680			515,109		
(b) Railroads.....	4,431,857	55,250,142	3.83	4,859,078	57,179,464	3.65
(c) Other.....	9,647,037			10,288,270		
Used in making coke at colliery.....	159,977	567,919	3.56	145,754	517,462	3.55
Used in making briquettes.....	10,343	41,790	4.05	19,046	70,418	3.69
Put on bank.....	545,402	1,903,692	3.49	836,605	2,869,590	3.43
Put on waste heap.....	267,620			318,161		
Total disposition.....	16,937,518	61,292,515	3.62	18,213,079	64,461,097	3.53
Lifted from bank.....	449,387	1,417,421	3.15	786,218	2,593,634	3.29
Total output.....	16,478,131	59,875,094	3.63	17,426,861	61,867,463	3.55

Table 276.—Disposition of Coal from Canadian Mines by Provinces, 1926

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	122,201	3,036	3,241	41,591	19,809		189,934
Coal shipped.....	6,034,378	166,773	415,072	6,123,705	2,036,490	156	14,866,574
Used under colliery boilers, etc.....	439,913	3,215	17,094	227,274	186,474	6	874,006
Used by companies' railroads.....	45,164		3,240	6,424	14,311		69,139
Used for manufacture of coke at colliery.....					159,977		159,977
Used in making briquettes.....				10,343			10,343
Used in shops, etc.....	4,009						4,009
Used by harbour tugs and dredges.....	514						514
Put on bank.....	371,355	5,527	2,219	67,617	93,684		545,402
Put on waste heap.....	15,582	9	1,410	78,118	172,347	154	267,620
Total disposition.....	7,063,149	178,610	442,276	6,555,075	2,698,092	316	16,927,518
Lifted from bank.....	315,672	5,499	2,473	51,370	74,373		449,387
Total output.....	6,747,477	173,111	439,803	6,593,795	2,613,719	316	16,478,131

Table 277.—Disposition of Coal from Canadian Mines by Provinces, 1927

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	121,366	3,243	3,731	48,545	24,414		201,299
Coal shipped.....	6,356,620	191,293	440,796	6,510,621	2,162,916	211	15,662,457
Used under colliery boilers, etc.....	458,110	6,728	22,624	249,473	202,310	3	939,248
Used by companies' railroads.....	51,361	1,253	2,887	8,081	14,854		78,436
Used for manufacture of coke at colliery.....					145,754		145,754
Used in making briquettes.....				19,046			19,046
Used in shops, etc.....	10,503						10,503
Used by harbour tugs and dredges.....	1,570						1,570
Put on bank.....	712,174	6,509	1,086	44,733	72,103		836,605
Put on waste heap.....	18,545	52	514	105,016	193,834	200	318,161
Total disposition.....	7,730,249	209,078	471,638	6,985,744	2,815,956	414	18,213,079
Lifted from bank.....	658,373	5,128	1,422	51,582	69,713		786,218
Total output.....	7,071,876	203,950	470,216	6,934,162	2,746,243	414	17,426,861

Table 278.—Shipments of Coal from Canadian Mines by Grades and Destinations, 1926 and 1927

(Short tons)

Destination	1926				1927			
	Run-of-mine	Screened	Slack	Total	Run-of-mine	Screened	Slack	Total
Prince Edward Island.....	8,744	74,888	3,598	87,230	3,411	73,069	8,788	85,268
Nova Scotia.....	320,123	582,864	789,646	1,692,533	297,117	534,515	797,888	1,629,520
New Brunswick.....	294,068	207,457	124,609	626,134	214,043	266,730	132,199	612,972
Quebec.....	43,951	1,119,591	805,004	1,968,546	50,294	1,194,541	1,062,350	2,307,185
Ontario.....	68	60,737	16,484	77,289	1,160	10,620	12,845	24,625
Manitoba.....	163,482	451,619	185,954	801,055	173,483	442,528	232,294	848,305
Saskatchewan.....	200,890	960,406	353,131	1,514,427	213,029	1,042,130	394,106	1,649,265
Alberta.....	259,829	506,690	530,702	1,297,221	273,319	610,615	605,228	1,489,162
British Columbia.....	77,516	545,746	305,188	928,450	45,222	625,861	330,150	1,001,233
Yukon.....		156		156		211		211
Total domestic shipments.....	1,368,671	4,510,154	3,114,216	8,993,041	1,271,078	4,800,820	3,575,848	9,647,746
Railroads.....	3,769,089	392,136	270,632	4,431,857	3,985,339	541,983	331,756	4,859,078
Ships' bunker.....	455,278	268,066	4,336	727,680	300,304	210,089	4,716	515,109
Total railroads and ships' bunker.....	4,224,367	660,202	274,968	5,159,537	4,285,643	752,072	336,472	5,374,187
United States.....	15,874	126,052	55,583	197,509	12,821	128,613	65,788	207,222
Newfoundland.....	21,420	237,514	10,075	269,009	47,288	223,226	8,947	279,461
West Indies.....	6,736			6,736				
Europe.....	10,687	2,779		13,466				
United Kingdom and Irish Free State.....	139,085	11,829		150,914	145,682			145,682
Other places.....	7,733	3,864		11,597	1,358	6,801		8,159
Lost at sea.....		4,765		4,765				
Total external shipments.....	201,535	386,803	65,658	653,996	207,149	358,640	74,735	640,524
Total.....	5,794,573	5,557,159	3,454,842	14,806,574	5,763,870	5,911,532	3,987,055	15,662,457

Table 279.—Tonnage Lost in the Coal Mines of Canada in 1925-1927 Showing by Provinces the Relative Percentages Produced and Lost with an Analysis of the Percentage Lost.

Province	Per cent produced	Per cent lost	Percentage lost through					
			Absenteeism	Lack of orders	Car shortage	Mine disability	Other causes	
Nova Scotia.....	1925	78	22	2.7	14.6	—	2.1	2.6
	1926	81	19	3.4	10.8	0.5	2.7	1.6
	1927	78	22	3.0	13.1	0.2	3.8	1.9
New Brunswick.....	1925	86	14	2.1	8.5	—	0.1	3.3
	1926	82	18	2.8	8.4	0.6	0.4	5.8
	1927	91	9	1.6	1.9	0.1	0.5	4.9
Saskatchewan.....	1925	68	32	—	31.0	—	—	1.0
	1926	65	35	0.1	32.5	0.1	0.6	1.7
	1927	68	32	—	30.3	—	0.1	1.6
Alberta.....	1925	69	31	0.7	24.7	0.9	0.9	3.8
	1926	74	26	0.9	21.2	0.5	0.5	2.9
	1927	78	22	1.1	16.7	1.5	0.6	2.1
British Columbia.....	1925	86	14	2.1	10.7	0.4	0.1	0.7
	1926	81	19	1.8	16.3	—	0.4	0.5
	1927	87	13	2.2	9.9	0.2	—	0.7
Canada.....	1925	75	25	1.5	19.2	0.5	1.1	2.7
	1926	78	22	2.0	16.5	0.3	1.2	2.0
	1927	79	21	1.9	14.5	0.8	1.9	1.9

Table 280.—Imports of Anthracite Coal into Canada from Great Britain, by Grades and by Provinces, 1925-1927

(Short tons)

Destination	1925		1926		1927	
	Egg, nut etc.	Dust	Egg, nut, etc.	Dust	Egg, nut, etc.	Dust
Prince Edward Island.....	507				3,210	
Nova Scotia.....	20,679		11,523		29,864	
New Brunswick.....	29,256		35,197		31,192	
Quebec.....	474,390	3,833	207,869		687,252	22,457
Ontario.....	20,564		12,589		10,494	
British Columbia.....	18		4,902		3,766	
Canada.....	545,414	3,833	272,170		765,778	22,457

Table 281.—Imports of Bituminous Coal into Canada from Great Britain, by Provinces, 1925-1927

(Short tons)

Destination	1925	1926	1927
Prince Edward Island.....	13,436		
Nova Scotia.....	19		
New Brunswick.....	5,103	110	17
Quebec.....	38,264	3,065	140,267
British Columbia.....		*768	25
Canada.....	56,822	3,943	140,309

*Includes 39 tons of lignite coal from Great Britain.

Table 282.—Imports of Anthracite Coal into Canada from the United States by Grades and by Provinces, 1925-1927

(Short tons)

Destination	1925		1926		1927	
	Egg, nut, etc.	Dust	Egg, nut, etc.	Dust	Egg, nut, etc.	Dust
Prince Edward Island.....	4,624		5,344		3,814	
Nova Scotia.....	33,393		39,186	8	29,522	
New Brunswick.....	45,010	683	61,432	272	69,540	928
Quebec.....	764,295	132,651	1,051,662	201,584	765,754	187,083
Ontario.....	2,149,016	84,469	2,389,779	115,311	2,061,663	130,692
Manitoba.....	28,182	6,214	13,981	4,009	12,752	3,133
Saskatchewan.....	702		464		484	
Alberta.....	30					
British Columbia.....	228		752		46	
Canada.....	3,025,480	224,017	3,562,600	321,184	2,943,575	321,936

Table 283.—Imports of Bituminous and Lignite Coal into Canada from the United States by Provinces, 1925-1927

(Short tons)

Destination	1925		1926		1927	
	Bituminous	Lignite	Bituminous	Lignite	Bituminous	Lignite
Prince Edward Island.....	9,208		1,622		5,050	
Nova Scotia.....	178,985	10	23,921		37,155	
New Brunswick.....	163,982		97,548		95,559	
Quebec.....	2,530,661		1,793,990		1,572,692	
Ontario.....	9,884,710		11,696,108		13,158,927	
Manitoba.....	147,758		149,374		142,860	
Saskatchewan.....	1,732		1,887		2,141	
Alberta.....	1,175		1,515		1,324	
British Columbia.....	39,550	18,358	31,960	10,384	22,292	10,829
Yukon.....	4		10		8	
Canada.....	12,957,765	18,368	13,797,935	10,384	15,038,008	10,829

Table 284.—Average Imports of Coal into Canada by Kinds and by Provinces for the Five Years 1923-1927

(Short tons)

Destination	Anthracite			Total bituminous	Total all grades
	Egg, nut, etc.	Dust	Total		
Prince Edward Island.....	5,075		5,075	6,835	11,910
Nova Scotia.....	54,045	1	54,046	71,980	126,026
New Brunswick.....	89,193	480	89,673	107,430	197,103
Quebec.....	1,348,600	197,080	1,545,680	2,160,957	3,706,637
Central Ontario.....	2,383,520	105,987	2,489,507	10,369,266	12,858,773
Head of Lakes.....	70,482	2,059	72,541	1,539,853	1,612,394
Total Ontario.....	2,454,002	108,046	2,562,048	11,909,119	14,471,167
Manitoba.....	27,906	3,764	31,670	139,147	170,817
Manitoba and Head of Lakes.....	98,388	5,823	104,211	1,679,000	1,783,211
Saskatchewan.....	1,092	40	1,132	1,986	3,118
Alberta.....	6		6	1,267	1,273
British Columbia.....	2,024		2,024	41,427	43,451
Yukon.....				10	10
Canada.....	3,981,943	309,411	4,291,354	14,440,158	18,731,512

Table 285.—Average Imports of Coal into Central Canada by Principal Areas for the Five Years 1923-1927

(Short tons)

Destination	Anthracite			Total bituminous	Total all grades
	Egg, nut, etc.	Dust	Total		
Quebec.....	86,436	4,267	90,703	212,683	303,386
Montreal.....	1,237,817	191,353	1,429,170	1,856,506	3,285,676
Ottawa.....	258,065	32,923	290,988	870,089	1,161,077
Kingston.....	110,401	2,051	112,452	219,041	331,493
Toronto.....	1,702,494	67,618	1,770,112	5,191,664	6,961,776
Windsor.....	311,994	4,541	316,535	3,048,608	3,365,143
Total.....	3,707,207	302,753	4,009,960	11,398,591	15,408,551

Table 286.—Exports of Canadian Coal by Destination, 1925-1927

(Compiled in the *External Trade Branch*)

Destination	1925		1926		1927	
	Short tons	Value	Short tons	Value	Short tons	Value
		\$		\$		\$
BRITISH EMPIRE						
United Kingdom.....	23,224	172,138	93,620	620,490	62,163	451,451
Irish Free State.....	1,688	10,325	81,600	489,964	131,218	682,295
British South Africa.....	7,736	46,159	9,200	55,890	9,923	67,865
Bermuda.....	4,182	80,321	619	4,510	640	5,315
British Guiana.....	4,651	88,110				
British India.....					157	1,413
British West Indies—						
Barbados.....	651	5,371				
Jamaica.....					675	3,536
Other B.W.I.....	8,451	50,712	1,845	15,056	353	2,910
Gibraltar.....	2,197	13,185	1,607	11,442	790	4,740
Newfoundland.....	183,245	1,071,624	276,116	1,484,290	281,872	1,473,336
Sierra Leone.....			3,256	19,533	1,247	7,794
Australia.....	13,688	117,653	19,257	149,004	23,895	182,730
New Zealand.....	6,127	36,762	1,197	7,182	15,479	90,663
Total British Empire.....	255,840	1,592,360	488,317	2,857,361	528,318	2,974,048
FOREIGN COUNTRIES						
Argentina.....			4,725	39,217		
Belgium.....	2,707	16,627	10,834	74,699	10,988	76,074
Brazil.....			1,210	6,050		
Chile.....			666	3,996		
China.....					2,155	15,192
Cuba.....	1,073	6,638	635	5,191	194	1,676
Denmark.....	1,197	7,309	2,150	14,235	909	5,762
Egypt.....	351	2,913	1,114	9,277	236	2,006
France.....	525	3,467	23,584	151,293	3,218	23,116
French Possessions—						
French Africa.....	296	1,776			226	1,356
French Oceania.....					637	3,758
Morocco.....					144	1,296
St. Pierre and Miquelon.....	5,239	31,069	3,328	19,040	5,291	32,380
Germany.....	1,508	9,048	5,725	40,717	10,353	71,084
Greece.....			2,995	18,762	2,027	12,264
Hayti.....			338	1,690		
Iceland.....			203	1,218		
Italy.....	4,566	27,396	16,378	110,904	18,108	113,814
Japan.....	6,325	42,986	13,183	89,223	6,664	47,635
Mexico.....	5,500	45,650	1,827	14,304	7,002	58,116
Netherlands.....	1,081	6,486	5,298	33,833	5,590	31,887
Norway.....			1,337	7,346	3,863	21,243
Panama.....	4,238	35,024	832	6,593		
Peru.....			446	2,676		
Portugal.....			898	5,388	598	3,588
Azores and Maderia.....	231	1,383				
Portuguese Africa.....	1,209	10,035				
Russia.....			5,734	47,592		
Spain.....	234	1,401			501	3,006
Canary Islands.....			7,648	37,769		
Sweden.....					477	2,911
United States.....	451,082	2,148,933	404,134	1,950,992	477,362	2,163,374
Alaska.....	30,728	237,673	24,710	187,364	27,150	216,713
Philippines.....	11,980	100,999				
Virgin Islands.....					518	3,056
Uruguay.....			451	2,706	801	5,006
Total foreign countries.....	530,070	2,736,813	539,883	2,882,075	585,012	2,916,311
Total.....	785,910	4,329,173	1,028,200	5,739,436	1,113,330	5,890,359

Table 287.—Annual Consumption of Coal in Canada, 1902-1927

(Short tons)

Calendar year	Canadian†		Imported coal "entered for consumption"				Total	Per capita
			From U.S.A.	From Great Britain	Total*			
	Short tons	%	Short tons	Short tons	Short tons	%		
1902.....	5,376,413	53.1	4,656,286	101,726	4,734,559	46.9	10,110,972	1.848
1903.....	6,005,735	47.3	6,520,931	134,593	6,678,450	52.7	12,684,185	2.212
1904.....	6,697,183	47.9	7,238,869	85,687	7,297,482	52.1	13,994,665	2.412
1905.....	7,032,661	49.4	7,233,738	68,500	7,215,446	50.6	14,249,107	2.341
1906.....	7,927,560	50.5	7,787,338	67,014	7,758,325	49.5	15,685,885	2.481
1907.....	8,617,352	45.0	10,588,697	54,325	10,549,503	55.0	19,166,855	2.947
1908.....	9,156,478	47.3	10,203,335	97,514	10,195,424	52.7	19,351,902	2.820
1909.....	8,913,376	47.9	9,805,253	67,671	9,711,826	52.1	18,625,202	2.682
1910.....	10,532,103	50.2	10,545,451	51,541	10,437,123	49.8	20,970,226	2.960
1911.....	9,822,749	40.5	14,510,129	48,963	14,424,949	59.5	24,247,698	3.365
1912.....	12,385,696	46.0	14,557,124	38,668	14,549,104	54.0	26,934,800	3.657
1913.....	13,450,158	42.6	18,145,769	37,825	18,132,387	57.4	31,582,545	4.196
1914.....	12,214,403	45.5	14,687,853	33,101	14,637,920	54.5	26,852,323	3.490
1915.....	11,500,480	48.1	12,450,796	15,098	12,406,212	51.9	23,906,692	3.041
1916.....	12,348,036	41.3	17,576,202	4,401	17,517,820	58.7	29,865,856	3.717
1917.....	12,313,603	37.2	20,848,009	9,451	20,810,132	62.8	33,123,735	4.049
1918.....	13,160,731	37.8	21,674,826	3,761	21,611,101	62.2	34,771,832	4.175
1919.....	11,611,168	40.3	17,292,913	344	17,236,269	59.7	28,847,437	3.402
1920.....	14,025,566	42.9	18,752,981	.....	18,668,741	57.1	32,694,307	3.788
1921.....	12,715,734	41.1	18,300,081	1,591	18,258,387	58.9	30,974,121	3.524
1922.....	13,044,352	50.2	12,255,555	765,980	12,962,189	49.8	26,006,541	2.900
1923.....	15,070,962	41.8	20,417,239	572,570	20,967,971	58.2	36,038,933	3.968
1924.....	12,529,358	42.8	16,405,344	317,112	16,714,143	57.2	29,243,501	3.100
1925.....	12,125,290	42.6	15,744,957	604,117	16,331,971	57.4	28,457,261	3.039
1926.....	15,449,831	48.3	16,204,405	287,299	16,565,555	51.7	32,015,386	3.329
1927.....	16,313,531	46.6	17,769,933	907,2.0	18,680,832	53.4	34,994,363	3.676

*The sum of Canadian coal mine sales, colliery consumption, coal supplied to employees, and coal used in making coke, etc., less the tonnage of coal exported.

†Includes small tonnages from countries other than Great Britain and United States. Deductions have been made to take account of foreign coal re-exported from Canada.

Table 288.—World Production of Coal* 1923-1927

(Including brown coal)

(Long tons)

Country	1923	1924	1925	1926	1927
BRITISH EMPIRE					
Great Britain—					
Anthracite.....	5,282,160	5,425,643	6,126,389	2,876,655	6,286,558
Bituminous (a).....	270,718,400	261,692,524	237,049,842	123,401,866	244,945,778
Nigeria (b).....	175,137	220,161	238,966	324,575	357,899
Southern Rhodesia.....	551,158	582,187	678,320	860,338	894,396
Union of South Africa.....	11,074,649	11,633,370	12,127,188	12,745,492	12,381,692
Canada—					
Anthracite.....	96	.....	.....	.....	.....
Bituminous.....	11,555,247	8,467,618	7,981,792	11,065,249	11,666,961
Sub-bituminous.....	416,511	526,936	509,513	437,264	532,281
Lignite.....	3,198,299	3,182,408	3,236,345	3,210,104	3,414,027
British Borneo—					
British North Borneo.....	62,670	90,000	79,941	71,434	†
Brunei.....	19,323	18,323	.....	.....	.....
Sarawak.....	.....	18,959	19,678	19,683	†
Federated Malay States.....	317,892	372,795	408,084	464,284	463,001
India—					
Gondwana Coalfields.....	19,217,176	20,696,338	20,447,898	20,583,202	22,082,326
Tertiary Coalfields.....	439,707	477,946	456,479	415,965	.....
Australia—					
Bituminous.....	12,517,430	13,757,500	13,626,777	13,250,000	13,522,960
Lignite.....	116,888	127,490	876,468	957,935	1,455,482
New Zealand—					
Bituminous.....	935,697	1,085,004	1,044,726	1,196,388	.....
Brown coal.....	860,360	839,017	911,425	905,825	2,366,994
Lignite.....	173,777	159,186	158,844	137,786	.....
Total.....	338,000,000	329,000,000	306,000,000	193,000,000	320,000,000

Table 288.—World Production of Coal* 1923-1927—Con.

(Including brown coal)

(Long tons)

Country	1923	1924	1925	1926	1927
FOREIGN COUNTRIES					
Austria—					
Bituminous.....	155,117	169,195	142,907	154,824	172,699
Brown coal.....	2,642,308	2,741,044	2,985,470	2,911,015	3,027,773
Belgium—					
Anthracite and semi-anthracite.....	4,964,048	5,067,144	4,769,356	5,247,611	27,130,404
Bituminous.....	17,589,897	17,919,307	17,962,898	19,613,048	
Bulgaria—					
Bituminous.....	60,610	68,550	71,827	1,186,713	1,218,099
Brown coal.....	985,957	1,126,766	1,131,353		
Czechoslovakia—					
Bituminous.....	11,437,922	14,934,995	12,360,640	13,953,092	13,794,932
Brown coal.....	15,942,098	20,130,874	18,310,843	18,223,237	19,310,756
France—					
Saar.....	46,118,296	13,806,602	12,784,692	13,464,803	13,391,097
Other districts—					
Anthracite and bituminous.....		43,311,590	46,353,460	50,581,400	50,960,760
Lignite.....		947,048	977,663	1,039,200	1,050,434
Germany—					
Bituminous.....	61,314,625	116,859,965	130,527,542	143,000,979	151,129,067
Brown coal.....	116,875,952	122,634,103	137,517,857	136,952,867	148,382,048
Greece—					
Brown coal.....	112,193	129,002	139,832	150,899	129,038
Hungary—					
Bituminous.....	848,890	732,430	776,943	813,846	771,551
Brown coal.....	6,736,958	6,231,501	5,417,385	5,561,158	5,932,251
Lignite.....				169,185	160,794
Italy—					
Anthracite.....	9,485	11,635	14,076	15,460	16,880
Bituminous.....	161,423	103,440	171,463	190,495	†
Brown coal.....	938,137	902,746	1,088,015	1,162,684	1,058,000
Jugoslavia—					
Bituminous.....	132,355	129,518	175,638	187,800	283,184
Brown coal.....	2,103,792	3,070,927	2,951,589	2,965,800	3,433,470
Lignite.....	1,294,296	917,998	959,027	921,754	954,586
Netherlands—					
Bituminous.....	5,195,706	5,787,020	6,740,404	8,471,616	9,338,555
Brown coal.....	53,314	188,129	204,344	207,858	†
Poland—					
Bituminous.....	35,517,851	31,706,783	28,622,028	35,182,768	37,482,601
Brown coal.....	168,285	86,623	64,638	74,825	77,225
Portugal—					
Anthracite.....	127,004	125,782	133,306	197,353	†
Brown coal.....	15,696	7,990	17,716	34,306	†
Rumania—					
Anthracite.....	58,348	148			
Bituminous.....	228,943	292,363	308,620	317,102	367,559
Brown coal.....	2,193,580	2,439,241	2,573,973	2,688,224	2,804,999
Russia—					
Anthracite.....			3,292,173	5,279,743	32,258,649
Bituminous—					
European.....	10,437,000	12,400,000	9,850,930	15,009,393	
Asiatic.....		1,400,000	1,603,818	2,830,323	
Brown coal.....		1,514,000	1,492,943	2,256,761	
Spain—					
Anthracite.....	294,263	311,108	311,047	396,494	402,580
Bituminous.....	5,581,214	5,717,998	5,709,680	6,036,364	5,538,064
Brown coal.....	387,932	405,155	396,330	393,515	417,064
Spitzbergen.....	335,482	444,651	406,768 (e)	286,531	†
Sweden.....	412,826	430,819	259,711	377,613	392,007
Algeria.....	3,180	9,080	9,879	13,600	20,932
Belgian Congo.....	55,000	80,000	80,000	88,800	86,000
Tunis (brown coal).....	610	300			
Greenland.....	2,083	2,500	2,500	2,500	2,500
Mexico.....	1,241,267	1,206,981	1,421,684	1,239,041	1,016,011
United States—					
Anthracite.....	83,338,401	78,506,217	55,193,883	75,390,582	72,011,000
Bituminous (c).....	504,068,448	431,862,980	464,332,804	511,934,808	464,110,714
Brazil.....	318,944	263,847	386,070		†
Chile.....	1,145,320	1,514,405	1,430,277	1,440,692	1,450,990
Peru.....	249,000	152,029	100,142	164,037	†
Venezuela.....	25,631	24,426	24,528	15,676	†
China (d).....	24,000,000	20,632,000	21,000,000	22,000,000	18,000,000
Dutch East Indies.....	1,138,036	1,446,731	1,378,602	1,443,200	1,500,000
Formosa.....	1,421,777	1,482,240	1,677,059	1,766,169	†
French Indo-China—					
Anthracite.....	985,339	1,151,757	1,288,888	1,226,943	1,422,083
Bituminous.....	49,259	59,769	46,907	37,428	38,041
Brown coal.....	5,337	4,492	8,648	5,510	7,038

Table 288.—World Production of Coal* 1923-1927—Concluded

(Including brown coal)

(Long tons)

Country	1923	1924	1925	1926	1927
FOREIGN COUNTRIES—Concluded					
Japan—					
Semi-anthracite.....	125,857	108,554	88,458	128,322	} 32,258,649
Bituminous.....	28,357,714	29,518,348	30,874,100	30,801,888	
Brown coal.....	149,028	173,923	166,750	158,589	
Karafuto.....		196,181	246,657	271,463	175,792
Korea.....	275,478	392,996	614,379	672,111	↑
Kwantung Peninsula.....	(e) 2,143,000	(f)	(f)		
Philippine Islands.....	41,000	46,518	47,183	47,912	↑
Turkey in Asia (g).....		756,713	733,235	1,174,052	1,287,900
New Caledonia.....			1,300	↑	↑
Total.....	1,000,000,000	1,010,000,000	1,040,800,000	1,150,000,000	1,130,000,000
Total.....	1,340,000,000	1,340,000,000	1,350,000,000	1,343,000,000	1,450,000,000

*Data obtained from *The Mineral Industry of the British Empire and Foreign Countries*.

† Estimate of production included in total.

(a) Including a small quantity of anthracite mined in the Fife and Clackmannan district.

(b) Years ended 31st March of the year following that stated.

(c) Including brown coal.

(d) Approximate production.

(e) Exports.

(f) Information not available.

(g) Héracleée-Zoungouldak coal basin.

THE COKE INDUSTRY IN CANADA

The production of gas-house and by-product coke in Canada during 1927 totalled 2,026,438 tons, as compared with an output of 2,027,058 tons for the previous year. Of this total output 1,582,662 tons were produced in the coke industry and 443,776 tons were recovered as a by-product from artificial gas plants. In addition there was also recovered as a by-product of the petroleum industry 76,229 tons of petroleum coke.

Statistics given in Table 289 refer only to by-product coke plants, or those plants making coke as the primary product.

The 6 plants included in the coke and by-products industry in 1927 represented a capital investment of nearly 30 million dollars, employed an average of 652 persons the year round and paid out \$1,118,538 in salaries and wages. Materials worth \$10,436,112 were converted into products having a selling value of \$15,318,880. There were 3 plants in Ontario, 2 in British Columbia and 1 in Nova Scotia.

Imports of coke during the year totalled 772,235 tons, a decrease of 22 per cent from the total of 988,034 tons brought in during 1926. Exports of by-product and gas coke totalled 74,109 tons, as against 41,699 tons in the previous year. In addition 17,424 tons of petroleum coke were exported during 1927 and 19,546 tons during 1926.

Table 289.—Principal Statistics of the Coke and By-Products Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of materials	Selling value of products	Value added by manufacturing
			\$		\$	\$	\$	\$
1923.....	5	5	20,494,442	598	842,376	11,437,863	13,901,445	2,463,582
1924.....	6	6	24,315,744	530	900,992	6,879,516	10,438,462	3,558,946
1925.....	6	6	23,905,454	583	885,637	7,112,311	11,020,298	3,907,987
1926.....	6	6	24,769,899	615	1,013,752	9,744,081	15,261,474	5,517,393
1927.....	6	6	29,879,157	652	1,118,538	10,436,112	15,318,880	4,882,768

Table 290.—Production in Canada, Imports and Exports of Coke and its By-Products, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
*Coal charged to ovens or retorts—		\$		\$		\$
(a) In coke plants:						
Domestic..... tons	598,280	2,070,313	938,134	3,041,854	809,135	2,704,159
Foreign..... tons	930,738	4,723,140	1,254,866	6,379,663	1,431,345	7,420,374
(b) In gas plants:						
Bituminous—Domestic..... tons	723,394	4,395,445	80,923	416,645	118,221	732,642
Foreign..... tons			620,360	3,857,538	506,608	3,035,897
Anthracite..... tons	15,323	183,050	3,477	41,277	225	3,130
Total..... tons	2,267,735	11,371,948	2,897,760	13,736,977	2,865,534	13,896,202
Coke						
†Output of coke, by provinces—						
Nova Scotia and New Brunswick... tons	307,253	1,667,781	484,760	2,373,863	417,380	2,020,953
Quebec..... tons	197,703	1,087,366	162,169	891,485	144,538	794,959
Ontario..... tons	830,839	5,967,333	1,144,493	8,208,124	1,260,355	8,542,988
Manitoba..... tons	30,660	326,882	34,509	371,715	35,641	386,071
British Columbia..... tons	180,284	1,433,479	201,127	1,460,738	168,524	1,219,241
Total..... tons	1,546,739	10,482,841	2,027,058	13,305,925	2,026,438	12,964,212
IMPORTS..... tons	852,427	5,553,494	988,034	6,566,686	772,235	4,742,224
EXPORTS..... tons	25,578	214,820	41,699	316,154	74,109	533,638
APPARENT CONSUMPTION..... tons	2,373,588	15,821,515	2,973,393	19,556,457	2,724,564	17,172,798
Other Products						
†PRODUCTION—						
Ammonium sulphate..... tons	18,251	909,097	23,655	1,015,578	24,708	1,030,991
Gas: (a) From coke plants..... M cu. ft.	12,124,442	2,030,129	17,891,146	2,793,982	18,097,241	2,901,280
(b) From gas plants..... M cu. ft.	13,507,487		14,067,676		14,758,928	
Light oils..... imp. gal.	2,100,705	263,503	1,989,409	131,999	2,019,456	139,394
Tar and tar products..... imp. gal.	18,804,192	1,050,655	24,949,885	1,494,786	25,647,309	1,631,276
All other products†.....		105,178		366,412		220,269
IMPORTS—						
Ammonium sulphate..... tons	398	27,544	2,298	135,455	3,181	160,150
Coal tar and pitch..... gal.	3,636,880	258,944	3,681,324	256,061	3,812,637	286,307
EXPORTS—						
Ammonium sulphate..... tons	12,560	637,310	16,382	813,115	16,947	730,815
Tar and pitch..... gal.	2,658,851	188,007	4,642,453	374,395	2,914,642	277,793

* Includes the consumption in companies' own coke plants and in associated metallurgical works.

† Production data include the output of the *Coke and its By-products Industry* and of the *Illuminating and Fuel Gas Industry*.

‡ Includes motor fuel, ammonia liquor and other products.

THE NATURAL GAS INDUSTRY

CANADA

No records are available prior to 1892, as to the production of natural gas in Canada. An estimate of the value of gas produced during that year placed the total at \$150,000.

Extensive developments in the oilfields of Ontario made large quantities of natural gas available for consumption. From 1892 to 1902 inclusive, Ontario is the only province for which we have gas production records. In 1903, the first production from other provinces was recorded. The value of natural gas produced in Canada during 1903 was approximately \$202,000 and from that year onward, there was an annual increase in production until in 1917, a total value of \$5,045,298 was obtained for 27,408,940 thousand cubic feet—the maximum recorded production for Canada. Owing to the increased prices received by producers, the valuation of the 1917 record output, has been surpassed annually since 1922.

Natural gas wells in operation in Canada during 1927 numbered 2,298. In the previous year 2,247 wells were producing.

This industry contributed 3.25 per cent of the total value of all minerals produced in Canada in 1927. In Ontario there were approximately 72,500 consumers of natural gas in area with a population of about 600,790 and in Alberta there were 28,161 consumers in areas where about 152,967 persons lived.

Production during 1927 showed a substantial increase over the total for the preceding year; the year's production amounted to 21,376,791 thousand cubic feet valued at \$8,043,010; in 1926 the figures were 19,208,209 thousand feet worth \$7,557,174. The province of Alberta continued to hold the premier position with a total of 13,434,621 thousand cubic feet; Ontario was next in order with 7,311,215 thousand cubic feet; and New Brunswick followed with 630,755 thousand cubic feet. Average prices per thousand cubic feet were as follows: New Brunswick, 20 cents; Ontario, 59 cents; and Alberta, 27 cents.

Imports of mixed gas (natural and artificial) amounted to 104,001 thousand cubic feet in 1927; during the previous year 119,310 thousand cubic feet were imported.

The natural gas industry in Canada as represented by the 172 companies operating in 1927 had a total capital investment of \$56,777,091. Ontario firms accounted for almost 58 per cent of this capital while the remainder was credited to Alberta and New Brunswick operators.

Employment was furnished to 1,342 salaried employees and wage-earners, whose combined earnings amounted to \$1,535,498. The average number of employees in Ontario was 1,023; in Alberta, 297; and in New Brunswick, 22.

Coal, fuel oil, natural gas and electricity used in this industry cost \$11,181. Primary power in operation during the year consisted of 148 units rated at 2,654 h.p. Electric motors used numbered 20 with a rating of 248 h.p. Boilers employed totalled 6 units rated at 245 h.p.

ONTARIO

The Annual Report for 1889 of the Mineral Statistics and Mines Branch of the Geological and Natural History Survey of Canada, gives the following information regarding the natural gas industry.

"Natural gas has been known to occur throughout Canada since the last century, though but little practical use was made of it till the year 1885. Numerous gas springs have been observed throughout Ontario, notably the "Gas Spring" at Caledonia Springs, Prescott county, and the "Burning Spring" at Niagara Falls, in Lincoln county; these two localities are historical, having been known at the beginning of the present century."

In July, 1885, a well was commenced at Port Colborne, Welland county, and the gas from this well was utilized in the following August. Two additional wells were sunk in Port Colborne at that time. Four wells were sunk in Collingwood during 1887 and 1888, from three of which gas was obtained. A productive well was also struck about this time at Delphi, five miles west of Collingwood.

In December, 1888, gas was discovered near Leamington, Essex County, and in 1889 another field was opened up in Welland county, about 25 miles west of Niagara Falls. Natural gas from these two fields was piped across the border to Detroit, Toledo and Buffalo. The export from the Essex field was discontinued in 1901, and in 1904 the production ceased. The eastern part of Niagara is still being supplied by the Welland field and the discovery well completed in 1889 continues to produce in paying quantities. Haldimand field was opened up in 1890; Tilbury was discovered in 1906; and Elgin in 1911. Smaller fields discovered in the province are: Hepworth field in 1900; Dawn field in 1911; and Dover field in 1917.

ALBERTA

The following quotation from a report by Charles C. Ross, supervisory engineer, Department of the Interior, Calgary, Alberta, gives a brief historical sketch of the developments in the natural gas industry in Alberta:—

"In 1885 the first natural gas discovered in southeastern Alberta was encountered in a well being drilled by the C.P.R. for water at Alderson, some thirty-five miles west and north of Medicine Hat.

In 1890, while prospecting for coal, a well was drilled within the city limits of Medicine Hat, and a flow of gas was encountered at 650 feet. The surface water was not cased off and as the gas pressure accumulated, the hole developed into a water geyser. The top of the well was plugged and is now covered by a spur track of the C.P.R.

This shallow production enthused the citizens of Medicine Hat to such an extent that enough money was subscribed and a small drilling machine being loaned by the C.P.R., a well was drilled and properly cased. A good flow of gas was obtained at 650 feet, with 235 pounds per square inch pressure, which resulted in eight wells being drilled to this producing sand. All have now been abandoned, with the exception of one, which is still producing.

The gas horizon known as the Medicine Hat gas-sand was penetrated for the first time in May, 1904 at a depth of 1,010 feet. The closed pressure was reported at 645 pounds per square inch, and the open flow at 2,225,000 cubic feet per day.

Since 1904 twenty-eight wells have been drilled, 17 by the city of Medicine Hat and the remainder by various industrial concerns. In addition, 9 wells were drilled by the industrial companies at Redcliff, four miles to the northwest, on the same structure."

The Canadian Pacific Railway drilled the first well in the Bow Island field in 1908, the development of this field has since been carried on by the Canadian Western Natural Gas, Light, Heat and Power Company, Limited.

The principal producing fields in Alberta, during 1927, were the Medicine Hat; Bow Island (about 40 miles west of Medicine Hat); Viking field (about 80 miles southeast of Edmonton); the Foremost field (about 6 miles south and west of the town of Foremost); and the Turner Valley field (about 35 miles southwest of Calgary). Natural gas was piped into Wainwright during 1927 from the Maple Leaf well in the Fabyan field. This field is approximately 8 miles west of the Wainwright Battle River oil field and 150 miles southeast of Edmonton. A small production was also obtained from wells in the Wainwright Battle River oil field.

The lure of cheap fuel has proved of great importance to certain western cities; in Medicine Hat, large industrial firms use natural gas for fuel. Three flour mills, the city power house (in which gas is used in boiler plants), 2 clay products plants and several foundries are the largest industrial consumers of this product. Redcliff, 2 miles west of Medicine Hat has 6 wells; the industrial users of this gas are the Dominion Glass Company and 3 clay products plants. Calgary and Edmonton, the largest cities in the province, are being supplied with natural gas. In Calgary there are over 13,000 domestic and 19 industrial consumers; in Edmonton, more than 7,500 domestic and 225 industrial users. Lethbridge and Wetaskiwin, and many towns are also being served by natural gas. In addition, many drilling companies in the province make use of this fuel in their operations.

NEW BRUNSWICK

Drilling for oil in New Brunswick in 1859 was rewarded by the discovery of natural gas. A résumé of the development of petroleum and natural gas industry in New Brunswick is given in this report under the section on "Petroleum."

Table 291.—Principal Statistics of the Natural Gas Industry in Canada, 1923-1927

Year	Number of firms	Number of wells	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	192	2,060	38,722,854	867	1,050,366	(a)	1,789,097	5,884,618
1924.....	186	2,031	50,561,757	1,240	1,315,405	2,250	(a)	5,708,636
1925.....	161	2,236	48,895,802	1,059	1,206,875	13,896	(a)	6,833,005
1926.....	169	2,255	57,231,261	1,254	1,448,778	40,444	(a)	7,557,174
1927.....	172	2,298	56,777,091	1,342	1,535,498	11,181	(a)	8,043,010

(a) Data not available.

Table 292.—Production of Natural Gas in Canada, by Provinces, 1892-1927

Year	New Brunswick		Ontario		Manitoba		Alberta		Canada	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
		\$		\$		\$		\$		\$
1892.....				150,000						150,000
1893.....				376,233						376,233
1894.....				313,754						313,754
1895.....				423,032						423,032
1896.....				276,301						276,301
1897.....				325,873						325,873
1898.....				322,123						322,123
1899.....				387,271						387,271
1900.....				417,094						417,094
1901.....				339,476						339,476
1902.....				195,992						195,992
1903.....				196,535				5,675		202,210
1904.....				253,524				74,852		328,376
1905.....				316,476				63,085		379,561
1906.....				533,446				50,077		583,523
1907.....				746,499				68,533		815,032
1908.....				949,297				63,363		1,012,660
1909.....				1,145,307				61,722		1,207,029
1910.....				1,271,303				75,168		1,346,471
1911.....				1,807,513				110,165		1,917,678
1912.....		36,549		2,036,245				289,906		2,326,151
1913.....	828,603	174,147	12,474,745	2,055,768			7,174,490	1,079,466	20,477,838	3,309,381
1914.....	425,826	54,249	14,094,521	2,215,808			7,172,157	1,214,670	21,692,504	3,484,727
1915.....	430,692	60,383	15,211,533	2,622,838			4,481,947	1,022,814	20,124,162	3,706,035
1916.....	610,118	79,628	17,953,109	2,765,105			6,904,231	1,113,296	25,467,458	3,958,029
1917.....	796,775	103,735	19,868,035	3,641,587			6,744,130	1,299,976	27,405,940	5,045,298
1918.....	792,396	107,842	13,029,524	2,884,460			6,318,389	1,358,638	20,140,309	4,350,940
1919.....	682,890	120,510	11,024,041	2,690,400			8,230,838	1,365,127	19,937,769	4,176,037
1920.....	682,502	130,506	10,529,374	2,920,731	200	60	5,633,442	1,181,345	16,845,518	4,232,642
1921.....	708,743	139,375	8,422,774	3,080,130	200	60	4,945,884	1,374,599	14,077,601	4,594,164
1922.....	753,898	148,040	8,060,114	4,076,296	200	60	5,868,439	1,622,105	14,682,651	5,846,501
1923.....	640,300	126,068	8,128,413	4,066,244	200	60	7,191,670	1,692,246	15,960,583	5,884,618
1924.....	599,972	113,577	7,150,078	3,798,381	200	60	7,131,086	1,796,618	14,881,336	5,708,636
1925.....	639,235	122,394	7,143,962	3,958,006	200	60	9,119,500	2,752,545	16,902,897	6,533,005
1926.....	648,316	128,300	7,764,996	4,409,593	200	60	10,794,697	3,019,221	19,208,209	7,557,174
1927.....	630,755	124,637	7,311,215	4,331,780	200	60	13,434,621	3,586,533	21,376,791	8,043,010
Total....	*9,871,021	1,769,940	*168,166,424	62,300,421	1,600	480	*111,145,521	26,341,745	*289,184,566	90,412,586

* Total quantity produced, 1913 to 1927.

Table 293.—Capital Employed in the Natural Gas Industry in Canada by Provinces, 1926 and 1927

	1926				1927			
	Prince Edward Island and New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
	\$	\$	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—								
Cost of lands, buildings, plant, machinery and tools.....		24,120,999	22,489,214	46,610,213	—	26,930,822	21,175,361	48,106,183
Cost of supplies and stocks on hand.....		489,206	430,437	919,643	—	646,361	213,521	859,882
Cash, trading and operating accounts and bills receivable.....		5,890,669	3,190,735	9,081,404	—	5,344,667	2,195,359	7,540,026
Total.....	620,001	30,500,874	26,110,386	*57,231,261	271,000	32,921,850	23,584,241	†56,777,091

* Includes data for New Brunswick and Prince Edward Island.

† Includes data for New Brunswick.

Table 294.—Number of Gas Wells in Canada, by Provinces, 1926 and 1927

		New Brunswick	Ontario	Manitoba	Alberta	Canada
Productive wells at beginning of year.....	1926 32 1927 35	2, 117 2, 126	1 2	86 84	2, 236 2, 247	
Number of productive wells drilled.....	1926 3 1927 3	86 119		3 3	92 125	
Number of dry wells drilled.....	1926 1 1927	35 30		1 1	37 31	
Number of wells abandoned.....	1926 1927	78 62		1 1	79 63	
Productive wells at end of year.....	1926 35 1927 38	2, 126 2, 172	2 2	84 86	2, 247 2, 298	

Table 295.—Natural Gas Wells in Ontario, by Townships, 1926 and 1927

Township	1926				1927			
	No. of producing wells in operation Dec. 31, 1926	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year	No. of producing wells in operation Dec. 31, 1927	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year
Amabel.....	2				2			
Ancaster.....			1					
Bayham.....	42	1			41	1		
Bertie.....	89	3		1	88			
Binbrook.....	46	3			46	1		
Brantford.....			1	1				
Caledon E.....	3				6			3
Caistor.....	36			1	15			
Canboro.....	136	7	1		130	12		3
Cayuga, North.....	80	6	3	17	90	7	7	16
Cayuga, South.....	58	5		6	60	1	2	4
Charlottesville.....	16				16			
Crowland.....	49	2		2	51			2
Dawn.....	6		2	1	10		3	4
Dorchester, N.....	3							
Dover, West.....	7			1	7			
Dunn.....	20	1	3	7	30		2	8
Enniskillen.....	3				3			
Euphemia.....	6				6			
Gainsboro.....	2	1	2		4			
Glanford.....	21	3			20	1		
Gosfield.....	14			4	19			5
Houghton.....	3		1		3			
Humberstone.....	94	2			89	3		
Logan.....			1					
Mersea.....	3				3			
Middleton.....	27	5	4	3	26		2	2
Malahide.....	2				2			
Moulton.....	103	6			105	3		
Oneida.....	25	3			23	2		
Onondaga.....	30	1		1	29	2		2
Rainham.....	109	5	2	17	120	4	3	24
Raleigh.....	15				16			
Romney.....	105	2		5	130	3	2	21
Sarnia.....	19				14			
Seneca.....	129	7			130	7	1	5
Sherbrooke.....	13				12			
Tilbury, East.....	135	2		2	130	4		3
Townsead.....	1		1		1			
Tuscarara.....			1					
Wainfleet.....	41	1			39	4		
Walpole.....	154	1	1	9	165	2	7	13
Walsingham, N.....	5	2			8			3
Walsingham, S.....	15			2	15			
Windham.....	4				8			1
Willoughby.....	36				39			
Woodhouse.....	50	5	2	1	49	1	1	
Private wells.....	300				300			
Surface wells.....	69		8	5	72			
Total.....	2, 126	78	35	86	2, 172	62	30	119

Table 296.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1926 and 1927

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1926							
Prince Edward Island and New Brunswick..	6	3	45	54	31,888	59,240	91,128
Ontario.....	330	76	454	860	455,271	387,034	842,305
Alberta.....	72	20	248	340	187,652	327,693	515,345
Canada.....	408	99	747	1,254	674,811	773,967	1,448,778
1927							
New Brunswick.....	4	2	16	22	17,900	20,944	38,844
Ontario.....	292	95	636	1,023	472,200	598,328	1,070,528
Alberta.....	73	18	206	297	174,947	251,179	426,126
Canada.....	369	115	858	1,342	665,047	870,451	1,535,498

* See note page 30.

Table 297.—Wage-Earners in the Natural Gas Industry in Canada, by Months and by Provinces, 1926 and 1927

Month	1926				1927			
	Prince Edward Island and New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
January.....	31	320	156	507	14	310	116	440
February.....	28	326	153	507	12	365	121	498
March.....	27	332	155	514	12	396	139	547
April.....	39	360	205	604	21	470	149	640
May.....	46	499	272	817	25	500	178	703
June.....	46	493	316	858	25	714	255	994
July.....	49	507	331	887	25	780	268	1,073
August.....	63	524	311	898	24	788	305	1,117
September.....	60	522	280	862	8	883	261	1,152
October.....	47	549	296	892	7	929	269	1,205
November.....	36	463	228	727	10	805	230	1,045
December.....	22	441	233	696	5	553	150	708

Table 298.—Fuel and Electricity Used in the Natural Gas Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
Bituminous coal—Canadian.....	Short ton	2,508	\$ 23,403	52	\$ 410
Bituminous coal—Imported.....	Short ton				
Fuel oil.....	Imp. gal.	84,665	5,443		
Gasoline.....	Imp. gal.			1,620	365
Gas.....	M cu. ft.	101,020	9,514	34,659	10,090
Electricity.....	K.W.H.	77,215	2,084	5,820	316
Total.....			40,444		11,181

Table 299.—Power Employed in the Natural Gas Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	13	419	7	199
Gasoline, gas and oil engines.....	142	1,147	141	2,455
<i>Total primary power.....</i>	<i>155</i>	<i>1,566</i>	<i>148</i>	<i>2,654</i>
Electric motors run by purchased power.....	6	96	5	30
Total power employed.....	161	1,662	153	2,684
Electric motors run by primary power in same plant.....	21	230	15	218
<i>Total electric motors.....</i>	<i>27</i>	<i>326</i>	<i>20</i>	<i>248</i>
Boilers.....	22	1,270	6	245

THE PEAT INDUSTRY IN CANADA

The Grand Trunk railway experimented with peat in 1866 making use of the condensed product produced by the Hodges process at Bulstrode, Quebec. During the same year, peat was used by the Caledonia Iron Works at Montreal in the smelting of iron. Geological Survey reports show that in 1869 the production of peat amounted to 14,000 tons; in the following year 16,000 tons were produced; and in 1871, the output was 10,300 tons. During 1900 shipments were recorded at 400 tons with a value of \$3 per ton. In 1920, when 4,550 tons averaging \$4.10 per ton were shipped, two bogs were in operation, one in Bruce county and the other at Alfred, Ontario. The Alfred bog was operated in 1925 by the Peat Fuels, Limited, using the air-dried machine process developed by the Ontario-Federal Committee. Sales during that year amounted to 1,370 tons valued at \$8,394. There was no production of peat during 1926 and 1927.

Table 300.—Production of Peat in Canada, 1900-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1900.....	400	1,200	1908.....	60	180	1916.....	300	1,500
1901.....	220	600	1909.....	60	240	1917-18.....		
1902.....	475	1,663	1910.....	841	2,604	1919.....	936	6,561
1903.....	1,100	3,300	1911.....	1,463	3,817	1920.....	4,550	18,650
1904.....	800	2,400	1912.....	700	2,900	1921.....	1,666	6,664
1905.....	80	260	1913.....	2,600	10,100	1922.....	3,000	14,500
1906.....	474	1,422	1914.....	685	2,470	1923-24.....		
1907.....	50	200	1915.....	300	1,050	1925.....	1,370	8,394
						1926-1927.....		
						Total.....	22,180	90,675

THE PETROLEUM INDUSTRY IN CANADA

Including (1) Production of Crude Petroleum; and (2) Petroleum Refining

1. Production of Crude Petroleum

CANADA

Crude petroleum was first obtained in Canada in 1858, when a shallow well was dug near Oil Springs, Ontario. This was the first productive oil well on the American continent. The first recorded production was for the year 1881, when 368,987 barrels were produced. A maximum production of 829,104 barrels was reached in 1894, however, from that year there has been a considerable annual variation until a minimum of 160,773 barrels was produced in 1924. The production of crude naphtha in Alberta in 1925, 1926 and 1927 increased the totals for these years very materially.

On December 31, 1927, there were 2,705 wells in operation in Canada, as compared with 2,785 active wells at the close of the previous year.

Crude petroleum production in Canada during 1927 showed an encouraging increase over the total for the preceding year. The year's production amounted to 476,591 barrels valued at \$1,516,043; in 1926 the total was 364,444 barrels worth \$1,311,665. Alberta's production, mainly from the Royalite No. 4 wet-gas well, topped the high mark of 1926, reaching a new record of 318,741 barrels. A slight increase was shown in the Ontario production for the year when 139,606 barrels were produced. Another feature of considerable worth was the proportionately large increase in the New Brunswick production, the 1927 figures being 18,244 barrels as against 10,544 barrels in the preceding year.

Petroleum and its products (exclusive of asphalt and asphaltum oil) imported into Canada during 1927 were valued at \$52,878,717, an increase of \$815,031 over the 1926 import value of \$52,063,686.

Capital employed in the crude petroleum industry in Canada during 1927, as reported by the 206 operating companies was \$22,773,916. Employment statistics showed 110 salaried employees and 671 wage-earners whose earnings totalled \$1,120,224.

Fuel and electricity used during 1927 was valued at \$112,763. Included in this amount was \$53,889 paid for 980,267 thousand cubic feet of natural gas and \$25,392 for 1,591,250 kilowatt hours of electricity. Primary power in use during the year consisted of 111 units rated at 3,364 h.p. Electric motors employed numbered 81 with a rating of 768 h.p. and boilers in use totalled 68 units rated at 4,186 h.p.

Bounties.—With a view to encouraging the production of oil from Canadian wells, the Dominion Government passed an Act in 1904 providing for "the payment of a bounty of 1½ cents per imperial gallon on all crude petroleum produced from wells in Canada on and after the eighth day of June, 1904—said bounty to be paid to the producer of the petroleum."

In 1907, the Act was amended by the addition of the words "or to such other persons interested, as the Governor-in-Council by regulation approves."

In 1908, the payment of bounties was limited by defining the oil on which payment of bounty might be made as that "having a specific gravity of not less than 0.8325 at 60° Fahrenheit produced from wells in Canada or from shales or other substances mined in Canada on or after the date on which this Act goes into force—the said bounty to be paid to the producer of the petroleum or to such other person interested as the Governor-in-Council by regulation approves."

In 1909, a further modification in the wording of the Act in respect to persons to whom bounty should be paid was made as follows: "The said bounty to be paid to or divided amongst the producers of the petroleum, the owner or occupier of the soil through which it is mined or won or such other person interested or injuriously affected by the mining operations or works as the Governor-in-Council by regulation approves."

A further limitation, this time in the amount of bounty payment, was made on June 30th, 1923, in which the following periods and rates of payments were established:

"The said bounty shall be paid during the periods and at the rates following, that is to say:

"On such crude petroleum produced on or before the thirtieth day of June, one thousand nine hundred and twenty-four, a bounty of one and one-half cents per imperial gallon shall be paid;

"On such crude petroleum produced on or after the first day of July, one thousand nine hundred and twenty-four, and not later than the thirtieth day of June, one thousand nine hundred and twenty-five, a bounty of three-quarters of one per cent per imperial gallon shall be paid;

"On such crude petroleum produced on and after the first day of July, one thousand nine-hundred and twenty-five, no bounty shall be paid."

As a result of the foregoing regulations, the payment of bounty was discontinued on July 1st, 1925.

Imports.—Very large quantities of crude petroleum are imported into Canada every year for various purposes, but chiefly to provide the necessary raw materials for the several petroleum refineries throughout the Dominion. It is probable that three-quarters of the total cost of crude petroleum imported into Canada is spent for crude oil that is subsequently refined in Canada.

A glance at the statistics of petroleum importations into Canada since 1880 reveals a wonderful development in this branch of foreign trade. In 1880, the value of petroleum products brought into Canada was \$221,143, and of this sum \$213,320 was spent for United States oils. Twenty years later, in 1900, the value of oil importations for the first time rose above the one-million dollar mark. Five years later, in 1905, imports were valued at \$2,481,072, and still nearly all the oil brought into Canada was obtained from United States sources. In 1910, imports were valued at almost double the sum paid out in 1905, and in that year for the first time relatively small amounts of oil were obtained from Mexico. In the next sixteen years, from 1910-1926, the imports of oil grew enormously, due largely to the development of the automobile industry. In 1927, Canada's imports of petroleum products reached a grand total value of \$53,844,494. The contrast between this value and \$221,143, representing imports in 1880, emphasizes the tremendous development of the petroleum industry in America.

While Canada still buys most of the imported oil from the United States, there has been a change in the foreign trade, due to the development of imports from Mexico and Peru. Whereas, in 1910, the value of oil imported from Mexico was only \$60,237, imports in 1920 were valued at \$1,560,611, and in 1925 and 1926 the value of petroleum products obtained from Mexico was maintained at about the same sum as in 1920. Canada's imports from Peru, first noted in 1915 when \$86,521 represented the value of the imports from this source, have grown appreciably until, in 1920, the value stood at \$1,982,550; in 1925, at \$2,532,828; in 1926, at \$5,586,283; and in 1927 at \$4,535,567.

Exports.—Canada has not yet been able to produce a sufficient supply of crude petroleum to permit the export of oil to other countries, so the foreign trade in petroleum is largely a matter of import trade into Canada. There are, however, some international dealings between the western United States and Canada's western provinces that are of interest. Crude oil imported from the Montana field has been treated in Alberta's refineries for the recovery of gasoline that finds a ready market for the operation of automobiles and tractors on the prairies. There is less market in the Canadian west for the fuel-oil fraction, and, as a result, it has been the practice to export quantities of this oil to points in the western States, where it finds a ready sale.

Canada's exports of gasoline have grown in the past six years from 164,433 gallons in 1920 to 3,867,536 gallons in 1926. During 1927 exports of Canadian gasoline totalled 2,463,379 gallons. The United States and Newfoundland are Canada's principal customers in this respect, but small shipments are also made to a number of other countries. In the export classification there is an item of "Oil, petroleum, crude," representing a considerable volume of trade, amounting to more than 18 million gallons in 1927; it is understood that this item represents the exports of fuel oil previously noted. There has been a fairly consistent export of coal oil or kerosene during the past seven years; most of the export trade in this commodity being to the neighbouring country of Newfoundland.

PRINCE EDWARD ISLAND

Drilling operations were in progress on Governor's Island, Prince Edward Island, during 1926. A well was drilled to a depth of 4,127 feet, when operations were suspended.

NOVA SCOTIA

Operations in Nova Scotia during 1926 and 1927 consisted mainly of drilling in the vicinity of southwest Mabou for the purpose of working out the geological formation in this district.

NEW BRUNSWICK

Interest in the oil seepages from the Albert shales in Albert and Westmoreland counties became more than local in 1859 and several United States oil men were aroused to the possibility of obtaining oil in these districts. Four wells were drilled to a depth of approximately 190 feet, near Dover and one at St. Joseph, Westmoreland county. Although flows of gas and small quantities of oil were obtained, the seeping in of water ruined these wells. Further drilling was carried on at these locations in 1879 and seven wells were sunk, but because of many difficulties and also due to the low price for petroleum these wells were abandoned. Intensive drilling was commenced about 1900 and continued until 1906; in all a total of 72 wells were drilled in Dover and St. Joseph districts, 1 in Kent county and 4 in Albert county; 17 petroleum wells were in operation in the Stony Creek field on December 31, 1927.

Production in New Brunswick was first recorded in 1910, when 1,485 barrels were produced. Variations between 1,000 and 2,000 barrels were registered during the period 1910 to 1917. A gradual increase in production was noted during the following years and in 1923, an output of 8,826 barrels was reached. The succeeding two years showed a considerable falling off, but, in 1926 the production for this province reached 10,544 barrels. In 1927, a record for the province was set up at 18,244 barrels.

ONTARIO

In 1858, the first oil well on the North American continent was dug to a depth of 100 feet at Oil Springs, Ontario. Drake's well in Pennsylvania was not dug until the following year. Early in 1862, a pioneer oil prospector brought in the first flowing well at Oil Springs, Ontario, and before the fall of the same year there were approximately 35 producing wells in operation. According to available information some of these wells produced from 3,000 to 6,000 barrels per day.

In 1865, Petrolia came into existence as a large producer and since that date has maintained its position among the leading oil-fields in Canada. Prior to this discovery, oil deposits were located in Kent county, at Bothwell. Although Petrolia, Oil Springs and Bothwell are by far the oldest producing fields in Canada, these three fields continue to rank as the premier producers in the province. An outstanding feature of the industry in Ontario took place in 1923 when a well was brought in, in Romney township on the shore of Lake Erie. The 1924 production from this well was 3,000 barrels. The importance of this well is that it lies in the Trenton and production from the Trenton has made the neighbouring state of Ohio one of the largest producers of petroleum and natural gas. In 1925, however, this deep Trenton production in the Dover and Romney fields was lost as the flow of oil was shut off with a plug. The companies owning these wells decided that the gas production from them was of more value to their customers, therefore, this step was taken.

Petroleum wells in operation in the province in 1927 numbered 2,669 as compared with 2,758 wells operating in the previous year. Productive wells drilled during the year under review totalled 8 and 198 wells were abandoned.

Col. R. B. Harkness, Commissioner of Gas for Ontario, states that the increase in the production in the Petrolia field was due perhaps more to the difference in the seasons than anything else. In 1926 cold weather froze up the jerk lines and forced many to close down for a time, whereas in 1927 there was no cessation of work. The small field discovered in 1926 in Camden township in the vicinity of Thamesville where some new wells have been drilled, increased the production by 2,000 barrels.

SASKATCHEWAN

Operations in the search for oil in Saskatchewan were conducted by 3 companies during 1927. The Unity Valley, near Vera, the Simpson field, and the Readlyn field were the centres of activity.

ALBERTA

Alberta's contribution to the petroleum output of Canada really began in 1917, although small quantities had been produced during each of the previous four years. In 1915 there were only 12 drills working in Alberta in the search for oil. The following explanation for this situation is advanced in a report by S. E. Slipper of the Federal Geological Survey:—

"Reaction from the wild speculation of 1914, the financial conditions caused by the war and the generally unsatisfactory results obtained thus far, are the causes for the decrease in activity and the waning of public interest."

The search for oil was continued in Alberta during 1916 and 20 standard drilling rigs were in operation. Maximum production for the early years of Alberta's oil output was reached in 1919, when 16,437 barrels were produced. A gradual decline was recorded until in 1924 only 844 barrels were taken from the wells. Then, with the bringing in of the famous Royalite No. 4 well, the output of the province rose sharply in 1925 and production in 1926 reached a total of 216,050 barrels. A new high mark was set up in 1927 when Alberta's production rose to 318,741 barrels.

The oil industry in Alberta has been reviewed by C. C. Ross, Supervisory Engineer of the Northwest Territories and Yukon Branch, Department of the Interior, as follows:—

"The year 1927 has seen steady progress in the development of the petroleum and natural gas resources of Western Canada. This may be gauged not only by the fact that great drilling activity prevailed, but that the results in oil and gas production, and also the very fact of their development add tangible data of very great value for the further development of the still largely latent resources of these minerals. A feature of the year has been the very considerable amount of detailed geological work that has been carried out by various groups, which will lead to the selection of much better chosen areas for future drilling than is otherwise possible either in the foothills region of Alberta, with the complex structural conditions there prevailing, or on the plains with the frequent masking of underlying formations by glacial drift. Such work is often accompanied or succeeded, particularly on the plains, by the drilling of test holes either by the diamond drill or otherwise to obtain data regarding concealed structures and very considerable footage of this kind has been made during the year, but this is not included with that drilling which aims primarily at the tapping of oil or gas. In this manner various structures have been mapped out and one important test well has been started at Warner, based on such work, whilst detailed surface geological work has resulted in the location of another deep hole to be commenced north of the Waterton Lakes.

"In Alberta drilling continued at Ribstone and Wainwright, at the latter one gas well being struck yielding 15,000,000 cu. ft. when measured. The most important development outside Turner Valley, so far as oil is concerned, was the striking of good production in the Ellis formation in the Devenish well near Skiff in Southern Alberta. This opens up great possibilities over a wide area which are being taken advantage of and drilling will shortly begin.

"In Turner Valley steady progress has been made and the known areas, beneath which both the high grade crudes of the upper formation and the naphtha-laden gas of the Royalite Dolomite occur, much extended. The high-grade crude area now extends as far north as the Senaca well located on Section 34, Township 20, Range 3, West of the 5th Meridian and southwards to the Home No. 1 well on Section 20, Township 19, Range 2, West of the 5th Meridian, whilst geologically there is no reason for supposing that these wells mark the limits in either direction. However, it may conservatively be said that the field is proven for over nine miles in length and one mile in width. The Royalite Dolomite is proving productive in all cases where drilled into, thus clearly showing that the original strike in Royalite 4 was not, as supposed by some, confined to a pocket. The continued production from the Dolomite shows no tendency to diminution and everything points to the vast source of this wet gas yet awaiting development. Seven wells have already reached it and the encouraging results have led the Royalite Company to start its No. 10 well, whilst independents are equally active.

"Royalite locations 11 to 16 have been made and these wells will be started early in the new year. An interesting development during 1927 has been the determined effort put forth to make the rotary drill a success and a number of heavy equipments are now working, notably that at the Millarville well, which is equipped with the "Ideal Haliburton Control." Very good drilling has been done by this system, but it is not yet decided whether this system or the cable system will eventually prove better suited for the difficult conditions prevailing in Turner Valley. The diamond drill has been used for drilling into the limestone in two wells and is proving a convenient method. The Illinois-Alberta well No. 2 is being drilled from surface by a diamond drill equipped with rotary fishtail and rock bits.

"A number of important tests projected for 1927 were postponed, an important factor bearing on this being the continued over-production in the United States. Until this shows signs of marked curtailment it seems likely that attention will be centred more on the detailed geological study of new areas than their intensive drilling with a view to immediate production. The latter will then develop rapidly as soon as market conditions appear favourable.

"The actual footage drilled shows a decrease which is accounted for by the fact that it is deeper drilling and consequently slower and also that a number of wells started previously have been completed. The total figures for the two years are:—

1926.....	162,000 feet.
1927.....	98,000 feet."

Table 301.—Principal Statistics of the Petroleum Industry in Canada, 1923-1927

Year	Number of firms	Number of wells	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	117	2,694	2,934,213	151	118,231	(a)	79,019	522,018
1924.....	119	2,473	5,650,086	158	152,957	(a)	(a)	467,400
1925.....	180	2,885	7,954,722	259	313,101	20,990	(a)	1,250,705
1926.....	210	2,822	17,639,142	634	788,843	77,902	(a)	1,311,665
1927.....	206	2,734	22,773,916	781	1,120,224	112,763	(a)	1,516,043

(a) Data not available.

Table 302.—Production of Crude Petroleum in Canada by Provinces, 1881-1927

(Barrel = 35 Imp. gal.)

Year	New Brunswick		Ontario		Alberta		Canada	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$		\$
1881.....			368,987				368,987	
1882.....			389,573				389,573	
1883.....			472,866				472,866	
1884.....			571,000				571,000	
1885.....			587,563				587,563	
1886.....			584,061	525,655			584,061	525,655
1887.....			713,728	556,708			713,728	556,708
1888.....			695,203	713,695			695,203	713,695
1889.....			704,690	653,600			704,690	653,600
1890.....			795,030	902,734			795,030	902,734
1891.....			755,298	1,010,211			755,298	1,010,211
1892.....			779,753	984,438			779,753	984,438
1893.....			793,406	874,255			793,406	874,255
1894.....			829,104	835,322			829,104	835,322
1895.....			726,138	1,086,738			726,138	1,086,738
1896.....			726,822	1,155,647			726,822	1,155,647
1897.....			709,857	1,011,546			709,857	1,011,546
1898.....			758,391	1,061,747			758,391	1,061,747
1899.....			808,570	1,202,020			808,570	1,202,020
1900.....			710,498	1,151,007			710,498	1,151,007
1901.....			622,392	1,008,275			622,392	1,008,275
1902.....			530,624	951,190			530,624	951,190
1903.....			486,637	1,048,874			486,637	1,048,874
1904.....			503,474	935,895			503,474	935,895
1905.....			634,095	856,028			634,095	856,028
1906.....			569,753	761,760			569,753	761,760
1907.....			788,872	1,057,088			788,872	1,057,088
1908.....			527,987	747,102			527,987	747,102
1909.....			420,755	559,604			420,755	559,604
1910.....	1,485	1,826	314,410	386,724			315,895	388,550
1911.....	2,461	3,019	288,631	354,054			291,092	357,073
1912.....	2,679	3,799	240,657	341,251			243,336	345,050
1913.....	2,111	3,762	225,969	402,677			228,060	406,439
1914.....	1,725	2,742	212,693	338,182	387	2,200	214,805	343,124
1915.....	1,020	1,423	214,444	299,149		†	215,464	300,572
1916.....	1,345	2,663	196,778	389,621		†	198,123	392,284
1917.....	2,341	5,460	202,991	473,477	8,500	63,302	213,832	542,239
1918.....	3,009	7,402	288,692	777,737	13,040	100,004	304,741	885,143
1919.....	4,225	13,141	219,804	625,342	16,437	97,841	240,466	736,324
1920.....	5,148	19,963	180,071	726,286	11,032	75,986	196,251	822,235
1921.....	7,479	33,022	172,859	559,198	7,203	49,313	187,541	641,533
1922.....	7,778	32,732	164,731	526,316	6,559	52,128	179,068	611,176
1923.....	8,826	35,642	159,400	478,149	1,943	8,227	170,169	522,018
1924.....	5,561	21,313	154,368	441,952	844	4,135	160,773	467,400
1925.....	5,376	18,756	143,134	386,555	183,491	845,394	332,001	1,250,705
1926.....	10,544	29,940	137,850	379,221	216,050	902,504	364,444	1,311,665
1927.....	18,244	41,748	139,606	288,347	318,741	1,185,948	476,591	1,516,043
Total.....	91,357	278,353	22,227,215	29,825,377	784,227	3,386,982	23,102,799	*33,490,712

* Total value from 1886 to 1927.

† Small production—no record.

Table 303.—Production of Crude Petroleum in Canada by Provinces, 1926 and 1927

Province	1926		1927	
	Barrels	Total value	Barrels	Total value
		\$		\$
NEW BRUNSWICK.....	10,544	29,940	18,244	41,748
ONTARIO—				
Petrolia and Enniskillen.....	56,170	153,428	60,171	123,235
Oil Springs.....	38,350	107,438	37,282	78,749
Moore Township.....	2,438	6,659	2,014	4,116
Sarnia Township.....	1,890	5,163	1,679	3,433
Plympton Township.....	1,047	2,860	493	1,008
Bothwell.....	25,382	69,331	25,184	51,437
West Dover.....	959	2,619	602	1,216
Raleigh Township.....	676	1,846	276	575
Onondaga.....	555	1,516	210	736
Moza Township.....	7,868	21,491	7,456	15,219
Thamesville.....	2,376	6,490	4,139	8,420
Dunwich.....	139	380		
Tilbury East.....			60	120
Euphemia.....			40	83
Total for Ontario.....	137,850	379,221	139,606	288,347
ALBERTA.....	216,050	902,504	318,741	1,185,948
Canada.....	364,444	1,311,665	476,591	1,516,043

Table 304.—Petroleum Wells in Canada, by Provinces, 1926 and 1927

	New Brunswick	Ontario	Alberta	Canada
Productive wells at beginning of year.....	1926 14 1927 17	2,862 2,758	9 10	2,885 2,785
Number of productive wells drilled.....	1926 3 1927	11 8	2 8	16 16
Number of wells abandoned.....	1926	163 198	2 7	165 205
Number of dry wells drilled.....	1926	12 4	1	13 4
Number of productive wells at end of year.....	1926 17 1927 17	2,758 2,669	10 19	2,785 2,705

Table 305.—Imports into Canada and Exports of Petroleum and its Products, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
IMPORTS—						
Crude petroleum in its natural state, .7900 specific gravity or heavier at 60 degrees temperature, when imported by oil refiners to be refined in their own factories.....	gals. 436,258,650	23,414,837	570,383,547	31,338,734	684,269,831	31,043,180
Crude petroleum, gas oils other than naphtha, benzine and gasoline lighter than .8235 but not less than .775 specific gravity at 60 degrees.	gals. 4,181,914	227,378	60,562	6,159	398,046	30,043
Petroleum, crude, not in its natural state, .7900 specific gravity or heavier at 60 degrees temperature, when imported by oil refiners to be refined in their own factories..	gals. 49,149	2,910	.....	.....	45,500	4,226
Petroleum (not including crude petroleum imported to be refined or illuminating or lubricating oils) .8235 specific gravity or heavier at 60 degrees temperature.....	gals. 103,667,295	4,690,901	97,050,028	4,006,369	81,343,133	3,524,132
Petroleum, and other oils, imported by miners or mining companies or concerns for use in the concentration of ores of metals in their own concentrating establishments.....	gals. 129,665	26,251	133,439	37,133	206,332	56,435
KEROSENE AND ILLUMINATING OILS						
Coal oil and kerosene, distilled, purified or refined.....	gals. 4,860,876	391,538	3,611,778	404,051	4,002,839	346,848
Illuminating oils, composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon.....	gals. 2,451	1,776	6,210	2,919	8,389	4,155
Coal oil and kerosene, distilled, known as "engine distillates", .725 specific gravity and heavier, but not heavier than .770 specific gravity at 60 degrees temperature.	gals. 395,785	63,587	1,224,464	139,404	26,127	2,523
Fuel oil, ex-warehoused for ships' stores (From April 1, 1927).....	gals. ....	.....	.....	.....	37,870,909	1,543,316
LUBRICATING OILS						
Lubricating oils, composed wholly or in part of petroleum, and costing less than 25 cents per gallon.....	gals. 3,813,543	712,850	5,180,614	959,341	5,132,017	858,483
Lubricating oils, n.o.p.....	gals. 4,632,195	1,770,739	5,079,264	2,009,214	6,741,630	2,797,435
GASOLINE AND OTHER OILS						
Gasoline under .725 specific gravity at 60 degrees temperature.....	gals. 58,993,020	8,388,057	60,105,404	8,670,438	85,432,311	8,794,848
Gasoline .725 specific gravity but not heavier than .770 specific gravity at 60 degrees temperature.....	gals. 24,897,661	3,204,479	22,666,298	3,277,288	22,503,290	2,602,949
Gasoline, n.o.p.....	gals. 37,070	7,093	67,986	11,069	232,727	20,897
All other oils, n.o.p.....	gals. 204,633	109,348	215,337	132,120	855,293	212,678
OTHER PRODUCTS OF PETROLEUM						
Grease, axle.....	lb. 3,776,077	230,151	4,556,607	290,092	4,920,965	277,128
Paraffine wax.....	lb. 1,601,505	124,234	1,946,905	141,241	3,820,893	182,725
Paraffine wax candles.....	lb. 208,887	46,257	382,373	82,213	435,602	96,183
Vaseline and all similar preparations of petroleum for toilet, medicinal or other purposes.....	.....	216,464	.....	205,463	.....	198,501
Petroleum, products of, n.o.p.....	gals. 1,243,176	213,577	2,247,183	350,438	1,745,896	282,032
Total.....	.....	43,842,427	.....	52,063,686	.....	52,878,717
EXPORTS—						
Oil petroleum, crude.....	gals. 7,375,163	346,512	21,043,135	851,750	18,793,254	923,948
Oil, coal and kerosene, refined.....	gals. 1,508,686	155,783	1,584,645	192,988	1,759,838	191,533
Oil, gasoline and naphtha.....	gals. 1,568,855	333,330	3,867,536	773,958	2,463,379	431,011
Oil, mineral, n.o.p.....	gals. 1,473,779	287,463	961,577	200,562	258,251	81,147
Wax, mineral.....	cwt. 14,541	82,999	10,682	62,329	3,609	21,327
Total.....	.....	1,206,087	.....	2,081,587	.....	1,648,966

Table 306.—Capital Employed in the Petroleum Industry in Canada, by Provinces, 1926 and 1927

	1926				1927			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
	\$	\$	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—								
Cost of lands, buildings, plant machinery and tools.....	1,975,464	150,631	13,869,772	15,995,867	2,046,056	178,000	15,193,332	17,417,388
Cost of supplies and stocks on hand.....	25,562	2,000	283,052	310,614	23,753	22,029	929,954	975,736
Cash, trading and operating accounts and bills receivable.....	25,775	13,300	1,293,586	1,332,661	20,981	57,417	4,302,394	4,380,792
Total.....	2,026,801	165,931	15,446,410	17,639,142	2,090,790	257,446	20,425,680	22,773,916

Table 307.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces, 1926 and 1927

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1926					\$	\$	\$
Ontario.....	14	1	118	133	17,594	96,476	114,070
Saskatchewan.....	2	1	18	21	3,180	19,615	22,795
Alberta.....	43	29	408	480	87,362	564,616	651,978
Canada.....	59	31	544	634	108,136	680,707	788,843
1927							
Ontario.....	23	.....	113	136	24,682	90,516	115,198
Saskatchewan.....	1	1	19	21	1,800	20,329	22,129
Alberta.....	63	22	539	624	146,277	836,620	982,897
Canada.....	87	23	671	781	172,759	947,465	1,120,224

*See note page 30.

Table 308.—Wage-Earners in the Petroleum Industry in Canada, by Provinces and by Months, 1926 and 1927

Month	1926				1927			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
January.....	106	.....	169	275	101	1	390	492
February.....	105	.....	157	262	102	1	376	479
March.....	106	.....	181	287	104	1	381	486
April.....	107	.....	216	323	105	8	423	536
May.....	108	8	246	362	110	12	439	561
June.....	115	16	339	470	111	18	439	568
July.....	119	14	365	498	105	13	475	593
August.....	116	18	385	519	104	13	528	645
September.....	108	18	398	524	101	19	561	681
October.....	110	22	377	509	100	19	585	704
November.....	109	17	347	473	98	10	632	740
December.....	109	1	333	443	96	.....	571	667

Table 309.—Fuel and Electricity Used in the Petroleum Industry in Canada, 1926 and 1927

Description	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Canadian.....	Short ton	2,544	16,145	3,561	26,867
Lignite coal—Canadian.....	Short ton	745	6,387	480	4,139
Fuel oil.....	Imp. gal.	180,118	8,419	22,980	977
Gasoline.....	Imp. gal.	4,513	1,304	4,042	1,039
Gas—natural.....	M cu. ft.	956,006	23,431	980,267	53,889
Wood.....	Cord	70	280	112	460
Electricity.....	K.W.H.	1,899,769	21,936	1,591,250	25,392
Total.....			77,902		112,763

Table 310.—Power Employed in the Petroleum Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	43	1,506	51	2,018
Gasoline, gas and oil engines.....	53	1,271	60	1,346
<i>Total primary power.....</i>	<i>96</i>	<i>2,777</i>	<i>111</i>	<i>3,364</i>
Electric motors run by purchased power.....	62	555	68	743
Total power employed.....	158	3,332	179	4,107
Electric motors run by primary power in same plant.....	7	12	13	25
<i>Total electric motors.....</i>	<i>69</i>	<i>567</i>	<i>81</i>	<i>768</i>
Boilers.....	49	2,562	68	4,186

2. The Petroleum Refining Industry in Canada

Canada's petroleum refining and blending plants numbered 23 in 1927 and represented a capital investment in lands, buildings, machinery and general equipment amounting to more than 56 million dollars. This industry afforded employment to 3,856 persons, and the total payroll was nearly 6.2 million dollars. Purchased fuel and electricity cost about 4 million dollars and purchased materials represented an outlay of 53 million dollars. The selling value of refinery products was about 64.5 million dollars. The value added by manufacturing, representing the difference between the selling value at the refinery of the products made and the cost of the crude oils and other raw materials used, amounted to 11.4 million dollars.

Production of gasoline from Canadian refineries in 1927 totalled 258.5 million gallons of which 73.7 million gallons were obtained by the cracking processes. The total value of production was about 35 million dollars. In the previous year only 222 million gallons of gasoline were made in Canada and the value was placed at 40.5 million dollars.

Kerosene is still an important product; production in 1927 totalled 54.3 million gallons, as compared with 58.5 million gallons in 1926.

Fuel and gas oils have been produced in much greater quantities during the past three or four years than formerly. In 1920, the output of fuel and gas oils from Canadian refineries amounted to 96.4 million gallons valued at 10.3 million dollars; in 1925 the output amounted to 172.3 million gallons valued at 9.7 million dollars; in 1926 the final output for sale and for use as a fuel in the refineries totalled 228.4 million gallons worth 12 million dollars; and in 1927 the total was 286.5 million gallons at about 13.6 million dollars. It is estimated that, in 1927, a further 206.6 million gallons of fuel and gas oils were used in the cracking processes in the various refineries.

Lubricating oils and greases, asphalt, wax, and candles, are other important products made in the oil refineries.

In the separation and purification of the various products obtained by the refineries in the treatment of crude oil, large quantities of sulphuric acid, caustic soda, and other chemical products are used. It appears that the consumption of 66° Bé. sulphuric acid in petroleum refining is approximately one pound of acid to six gallons of crude oil; for caustic soda, the average seems to be about one pound to 100 gallons of oil. The consumption of containers, cooperage stock, etc., reaches large figures annually, even though some shipping containers used for oil are returnable. The total cost of materials used in manufacturing in 1927 was in the neighbourhood of 53 million dollars.

Canadian refineries, situated at strategic points across the Dominion for convenience in marketing their products, treated in 1927, about 15.6 million gallons of oil from Canadian wells (including naphtha from the Turner Valley wells in Alberta), and about 600 million gallons of imported oils obtained chiefly from the United States, Mexico, and Peru.

There are now 16 plants in Canada engaged in the refining of oils for the production of gasoline, kerosene, lubricating oils, waxes, and petroleum coke. Of these, 4 are located in Ontario, 4 in Alberta, 3 in British Columbia, 2 in Quebec, and one in each of the provinces of Nova Scotia, Manitoba and Saskatchewan. Seven other plants make lubricating oils and greases as their principal product. Of these, 4 are located in Ontario and 3 in Quebec.

Table 311.—Principal Statistics of the Petroleum Products Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries	Wages	Cost of fuel and electricity	Cost of materials	Selling value of products	Value added by manufacturing
			\$		\$	\$	\$	\$	\$	\$
Petroleum refining—										
1923.....	10	14	60,288,861	4,196	816,751	4,714,818	4,054,846	36,435,306	45,571,506	9,136,200
1924.....	12	17	53,095,784	3,603	866,974	4,757,004	3,580,032	36,669,292	48,677,347	12,008,055
1925.....	8	13	49,461,900	3,655	913,688	4,708,210	3,433,017	37,814,303	49,802,615	11,988,312
1926.....	12	17	56,476,449	3,698	1,028,346	4,754,243	3,580,049	50,783,871	70,570,240	19,788,369
1927.....	11	16	55,442,193	3,802	1,107,642	4,970,584	3,628,842	52,743,530	63,979,849	11,236,319
Lubricating oils and greases—										
1923.....	6	6	738,843	62	93,628	23,123	6,236	381,390	709,028	327,638
1924.....	8	8	700,010	66	94,307	31,420	6,500	423,419	733,720	310,301
1925.....	8	8	1,118,649	83	101,252	51,896	14,113	446,721	959,512	512,791
1926.....	6	6	701,676	55	78,411	31,399	4,746	388,288	626,071	237,783
1927.....	7	7	693,371	54	85,824	24,176	4,614	316,391	548,971	232,580
Total—										
1923.....	16	20	61,027,704	4,257	910,379	4,737,941	4,661,082	36,816,696	46,280,534	9,463,538
1924.....	20	25	53,795,794	3,669	961,281	4,788,424	3,586,532	37,092,711	49,411,067	12,318,356
1925.....	16	21	50,589,549	3,738	1,014,940	4,760,106	3,447,130	38,261,024	50,762,127	12,501,103
1926.....	18	23	57,178,125	3,753	1,106,757	4,785,642	3,584,795	51,172,159	71,196,311	20,024,152
1927.....	18	23	56,135,564	3,856	1,193,466	4,994,760	3,633,456	53,059,921	64,528,820	11,468,899

Table 312.—Materials Used and Products Made by the Oil Refineries of Canada, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
MATERIALS USED—						
Crude oil, product of Canadian wells..... imp. gals.	12,337,192	1,511,181	12,203,286	1,673,632	15,632,271	1,783,413
Crude oil, imported..... imp. gals.	432,778,502	33,344,004	573,263,043	45,396,649	700,737,619	47,376,673
Sulphuric acid (66° Be) (Not made by firm reporting)..... lb.	42,843,604	447,528	53,919,554	423,229	49,728,504	407,894
Sulphur (not used in acid manufacture)..... lb.	141,265	3,988	155,076	4,283	145,980	4,498
Caustic soda..... lb.	4,220,371	154,150	6,216,823	234,326	3,798,427	147,684
Soda ash..... lb.					412,489	8,594
Litharge..... lb.	549,450	59,825	697,417	72,269	473,785	46,714
Fullers' earth..... lb.	1,281,190	14,433	4,784,069	50,460	8,304,713	80,611
Other materials.....		777,243		1,021,695		691,442
Shipping containers.....		1,501,951		1,907,328		2,194,007
Total.....		37,814,303		50,783,871		52,743,530
PRODUCTS MADE—						
Gasoline..... imp. gal's	164,670,072	27,589,037	222,146,704	40,467,868	258,549,724	35,173,348
Petroleum spirits..... imp. gal's	1,137,787	199,618	1,650,956	245,841	6,205,538	721,618
Kerosene..... imp. gal's	45,026,459	5,966,913	58,502,190	9,402,396	54,316,079	6,621,413
Fuel and gas oils..... imp. gal's	172,387,242	9,652,255	228,474,212	12,007,320	286,525,733	13,584,412
Lubricating oils..... imp. gal's	14,801,986	2,697,142	16,894,609	3,671,756	18,532,072	3,434,443
Grease..... lb.	9,076,336	184,033	10,903,112	218,965	11,101,247	239,818
Petroleum coke..... tons	34,018	248,691	51,545	307,443	76,229	449,218
Wax and candles..... lb.	15,736,867	734,322	9,858,490	648,303	9,526,072	505,133
Asphalt..... imp. gal's	19,942,310	1,845,563	20,721,103	2,035,697	21,803,479	2,287,464
Other products.....		685,041		1,564,651		962,982
Total.....		49,892,615		70,570,240		63,979,849

CHAPTER NINE

THE NON-METAL MINING INDUSTRIES IN CANADA. (Other than Fuels)

Including detailed data relating to operations in the following industries:—

Abrasives	Miscellaneous—
Asbestos	Actinolite
Feldspar	Barytes
Graphite	Bituminous sands
Gypsum	Fluorspar
Iron oxides	Lithium minerals
Mica	Magnesite
Quartz	Magnesium sulphate
Salt	Mineral waters
Talc and soapstone.	Natro-alunite
	Phosphate
	Pyrites
	Silica brick
	Sodium carbonate
	Sodium sulphate

Abrasives, Natural

CANADA

Corundum, diatomite, garnets, grinding pebbles, grindstones and volcanic dust are all discussed.

Data regarding these various abrasive materials will be found in the reviews of the several provinces in which they occur.

Grindstones.—The early history of the grindstone industry in Canada has been outlined by V. L. Eardley-Wilmot of the *Federal Department of Mines*, as follows:—

The quarrying and manufacture of grindstones is one of the oldest industries in Canada. There are in northwestern Nova Scotia and southeastern and northeastern New Brunswick probably upwards of a hundred old sandstone quarries which have at some time been worked for grindstones.

The grindstone industry had its beginning at the head of Chignecto bay, near Minudie, Cumberland county, Nova Scotia, about 1750, when the sandstone beds were worked by the French. For a number of years activities were confined along the coast at "The Joggins" now called Lower Cove, 6 miles to the south of Minudie. These quarries which were first worked by the English in 1790, eventually became the largest on the bay of Fundy, and were operated almost continuously until 1906. About 1764, Joseph Des Barres, Governor of Prince Edward Island, secured a Crown grant of the Minudie-Joggins territory and leased various sandstone ledges to the farmers, who for many years made rough grindstones by hand.

Old records between 1800 and 1830 showed that an enterprising storekeeper by the name of William Harper used to make periodic rounds in his schooner, the "Weasel", visiting Dorchester, Hopewell, Grind stone island, Sackville, and Joggins, and exchange food, clothing, and other necessities for the grindstones made in these places. Cargoes of 40 to 60 tons of stones were frequently collected and distributed to local users; he also found a ready market for large quantities of stones at "Quoddy" (Passamaquoddy) which was then on the disputed International Boundary. There were several other traders besides Harper, who engaged in this business.

During the years 1815 to 1830, Messrs. Joseph Read and John T. Seaman acquired control of the Lower Cove quarries from the Des Barres' estate and made regular shipments of grindstones to the United States by means of small vessels. These shipments went only as far as the frontier port of Eastport where they were transferred into United States vessels for Boston and other places. In 1824, a branch office was established at Boston by Joseph Read, 2nd, which was continually maintained by him and his successors until 1888.

Between 1830 and 1833 the Des Barres' estate was purchased by Amos, youngest brother of John T. Seaman, and he and his successors, except for short leases, continued the business at Lower Cove and the near vicinity until about 1895. After Amos Seaman obtained control of the Lower Cove quarries in 1833, Joseph Read 2nd, opened sandstone quarries at Ragged Reef, on the Chignecto Bay shore, some 6 miles to the south. He also had grindstones made by contract at other places in the bay where suitable rock was bared by the tides, principally at Sand cove, Sand river, and around the mouth of the Apple river, along a distance of about 25 miles of shore line. Stones from the latter quarries, exported to the United States, were often shipped in Parrsboro schooners, which accounts for the shipments of grindstones from Parrsboro mentioned in old reports.

Operations in this area were barely profitable after 1860 owing to increased difficulties in quarrying operations, to the abrogation of the Reciprocity Treaty in 1866, to the imposition of high duties by the United States in the sixties, and to the opening of large quarries in Ohio."

Data obtained in the census of 1871 show that capital invested in grindstone plants in Canada was \$58,509; employment was furnished 328 men with a total wage of \$53,987; and the value of products made was \$78,395. Ten years later, the 11 quarries in operation represented an investment of \$70,700; employed 204 men and produced stones to a value of \$50,737. In 1886, there were 6 quarries operating with a total production of 4,020 tons. The maximum recorded output for the industry during the period 1886 to 1927 was reached in 1888 when 5,764 tons were shipped. During 1927 the production totalled 1,317 tons made up of 11 tons from Nova Scotia and 1,306 tons from New Brunswick.

Old records show that the average price of grindstones, between 1800 and 1830, was about 5 to 6 shillings per "stone" or between 70 and 80 shillings per ton. There are, however, many instances of poor quality stones selling for 9 shillings per ton and one case is cited of 60 tons being sold at 7 shillings per ton. In 1860 the average price was about \$13 per ton. From 1874 to 1879, the price dropped from \$16 to \$13 and maintained an average of \$12 until 1888.¹

Prices varied from \$8 to \$9 per ton during the period 1888-1904; but increased to \$10.95 in 1905 and remained fairly constant until 1914. A considerable annual advance was recorded during the ensuing years until the maximum of \$38.20 per ton was reached in 1921. The average price obtained in 1927 was \$36.05 per ton.

Pulpstones.—The production of pulpstones in Canada commenced in 1891 from a quarry near Newcastle, New Brunswick. In 1892 shipments were recorded at 60 tons worth \$900, and since that date pulpstones have been produced almost continuously from New Brunswick quarries. During 1923, a British Columbia deposit was opened up and shipments from this source have reached a grand total of 1,801 tons.

Sharpening Stones.—"There are a large number of fine-grained sandstones and siliceous argillites and mica schists in Canada that are suitable for whetstones, but for a number of years none have been produced other than a small annual output by one or two grindstone producers. There was a large output about a century ago from Whetstone island, Memphremagog lake, in the Eastern Townships of Quebec, and 50 years ago there was a big production annually from Lower Cove, Cumberland county, Nova Scotia.

Scythestones are now produced only by the Read Stone Company from their quarry at Stonehaven Chaleur bay, New Brunswick. The company has been manufacturing these stones, which are of good quality from a very fine grit and even-textured, blue sandstone since about 1880. The stones which are made in several patterns are shipped under the trade names of "Canada Red end," flat; "Bay of Chaleur" oval; "English round," round tapered: and are packed in boxes containing one-quarter gross. Probably about 1,700 tons of these scythestones have been produced to date, but in recent years the output has been only about 35 tons annually. These stones are nearly all sold in the Canadian markets, but in the past a considerable tonnage of rough blocks was shipped to the United States to be made into scythestones. The "Acme" stone is made from a finer grit quarried at New Bandon. This same stone was at one time shipped as rough blocks for marble polishing. Crude blocks have also in recent years been shipped to the United States from Mic Mac Quarry Company, Nova Scotia, to be made into scythestones, but on account of the brittleness of the sandstone it is mainly used for the large oval-shaped stones. A small quantity of this stone, known as "Brown grit" is used for hand rubbing marble.

The nine firms reporting under the natural abrasives industry in Canada during 1927 had a total capital investment of \$433,810. Employment was furnished 132 men whose earnings amounted to \$107,603, and fuel and electricity costs totalled \$10,279.

NOVA SCOTIA

Diatomite.—The Canadian production of diatomite has been obtained from deposits in the province of Nova Scotia. In 1896, shipments of diatomite totalling 644 tons were made; this was the first official record of production in Canada. Deposits at Silica lake and near St. Ann's, Cape Breton, have been worked. The total production to date amounts to 630 tons valued

¹Eardley-Wilmot, V.L.: "Siliceous Abrasives."

at \$230,679. Since 1912 the Oxford Tripoli Company has been the only shipper. This company's shipments prior to 1927 have been made from deposits located in the vicinity of Silica lake, Colchester county. The diatomite was calcined in rotary furnaces before shipment to a plant at Haverstraw, New York. Development work was carried on during 1926 in connection with a diatomite deposit at East New Annan, Nova Scotia and in 1927 shipments of diatomite amounting to 266 tons were made.

Grindstones.—At Lower Cove near Joggins and at Minudie, grindstones were produced as early as 1750. Production from these quarries is reported to have been over 4,000 tons annually for a number of years around 1850. In 1873 shipments from Minudie amounted to 1,590 tons and in the following year the output from Lower Cove was 750 tons valued at \$12,000; and from Shore Cove, 350 tons worth \$4,200.

Sandstone deposits near Pictou and Merigomish Harbour were operated between 1840 and 1865. At the present time the Mic Mac Quarry, east of Woodburn, is the only one in the province producing grindstones. This quarry averaged 300 tons annually from 1913 to 1926. The majority of the stones are shipped to the United States for saw and machine knife grinding.

Quarry Island has been the scene of operations for 60 years, and during the period 1870 to 1914 a production of 200 tons to 300 tons was recorded annually. However, since that time only a small quantity has been shipped each year.

NEW BRUNSWICK

Grindstones and Pulpstones.—Considerable activity was evidenced in this industry on Grindstone island during the period 1800-1850, but since the latter date no shipments appear to have been made. From 1835 to 1885, a large number of quarries were operated in the southern part of the peninsula, between Petitcodiac and Memramcook rivers. These grindstones were exported mainly to the United States for file and spring grinding purposes. The Beaumont quarry was opened up in this district in 1899 and was closed down in 1919. In 1923, the Rockland quarry situated north of the Beaumont was opened up and since then some experimental shipments have been made.

Grindstone production started at Rockport in 1815. Practically all of the stones cut since 1890 were sent to the Wood Point plant in crude form for finishing. Prior to 1880, a small quantity of grindstones was produced from the sandstone reefs near Wood Point. From 1896 to 1906, production from these quarries ranged between 200 tons and 300 tons annually, which was increased to 800 tons to 1,000 tons during the next ten years. There have been no grindstones produced here since 1918.

In Northumberland county the production of grindstones commenced in 1870. Quarries have been operated at various points near Newcastle, but, with the introduction of Ohio stones on the New England markets operations were curtailed and only the Miramichi, Read and Fish quarries remained active.

The Miramichi Quarry.—Sandstones have been extensively quarried on both banks of the Indiantown brook, a tributary of the Southwest Miramichi river, 8 miles southwest of Newcastle. The quarry was first opened up in 1897 for building stone by William Hood; and in 1905 the Miramichi Quarry Company was formed.

The pulpstones which are produced in sizes up to the 5-foot magazine grinders have been used in numerous Canadian pulp mills and have apparently given satisfaction. The company has been a steady producer of pulpstones since 1905. Although the quarry furnishes the largest number of pulpstones in the Dominion, its main output is building stones. The grindstones are suitable for axe and coarse tool grinding, but only a few hundred have been made, mainly between 1918 and 1920.

The Read Quarry.—This quarry is situated on the east side of Indiantown brook, directly opposite the workings of the Miramichi Company. The quarry was opened over 40 years ago for building stone; and after being closed for some time was re-opened in 1916 by the Read Stone Company and worked, under the management of Mr. Holt, until 1922.¹

The Fish quarries commenced operations in 1885 and shipped about 130 tons of grindstones annually for 15 years. From 1891 to 1903, a total of 1,700 tons of pulpstones were produced from these quarries.

In the Chaleur bay district operations commenced in 1844 and have been continuous since that date. The major portion of the Canadian production of grindstones during the past 30 years has been obtained from the Stonehaven quarries. Work was started on these quarries in 1863.

Grindstones are made here in all sizes from 8 inches to 7 feet in diameter and 1 to 14 inch face. The smaller stones up to 30 inches in diameter are used by farmers and in lumbering operations. The 30 to 50 inch stones are used in machine shops. The large stones, for which there is now the greater demand are mainly used for grinding edge tools, files, machine knives, saws, scythes, skates, and for granite-cutting. Previous to the introduction of artificial grinding wheels the large stones were also extensively employed for agricultural implement and axe grinding.¹

New Brunswick grindstone quarries in operation in 1871 employed 200 men earning \$30,635 and made \$40,953 worth of products. In 1881 eight quarries were operated, seven in Gloucester county and one in Westmoreland, with a capital investment of \$10,250; a payroll of 136 men receiving \$20,975 in wages and a production valued at \$30,297. The high record for the industry, according to available information, was reached in 1907 when 4,833 tons were produced. In 1927 only two firms were operating and their total production of grindstones amounted to 1,306 tons.

QUEBEC

Grindstones.—About 1830 the grey sandstones on the east side of Grindstone island, the centre island of the Magdalen group were worked by the French inhabitants and grindstones made for local use.

Garnets.—In 1927 development work was done on a garnet deposit in Joly township, Labelle county, and a shipment of 2 tons was made.

ONTARIO

Grindstones.—Small grindstones and scythestones have been shipped from sandstone deposits in Clara and Nottawasaga townships. Shipments from the former township were made between 1870 and 1875 and from the latter between 1860 and 1870.

Grinding Pebbles.—Grinding pebbles have been obtained for a number of years along the shore of Lake Superior, near Jackfish. During 1920 the production amounted to 560 tons; in 1925 the total was 105 tons; and in 1926 shipments were considerably lower, amounting to only 64 tons. During 1927 there was no production of grinding pebbles in Canada.

Corundum.—Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. The industry made its appearance there in 1900 and production reached a maximum in 1906. In 1921, grain corundum amounting to 403 tons valued at \$55,965 was exported to the United States. Since that date no shipments of corundum have been reported.

Garnets.—A deposit of garnets in Ashby township, Ontario, was operated during 1923 and 1,250 tons of garnet concentrates and crude garnets were shipped to Niagara Falls, New York, for use as an abrasive material. In 1924, a shipment of 360 tons of garnets was made but there was no production of this commodity in 1925, 1926 and 1927.

SASKATCHEWAN

Volcanic Dust.—Extensive beds of volcanic dust that occur near Waldeck, 11 miles north-east of Swift Current, were first discovered in 1918. The material has been marketed in the form of cleansers and hand cleaners. Shipments during 1925 amounted to 160 tons valued at \$1,380, in 1926 a total of 90 tons worth \$630 was shipped and in 1927 a production of 105 tons valued at \$735 was recorded.

BRITISH COLUMBIA

Pulpstones.—A sandstone quarry situated on Newcastle Island about one mile northeast of Nanaimo commenced shipping pulpstones in 1923. These stones are mainly of smaller sizes, although a few magazine grinders have been produced. The total production of pulpstones from this deposit to date has amounted to over 1,801 tons.

Grinding Pebbles.—The Hedley Gold Mining Company used pebbles obtained from Hedley, Similkameen district in 1922. These pebbles were produced at a cost of \$4 per ton as compared with \$35 per ton for the imported Danish.

Table 313.—Principal Statistics of the Natural Abrasives Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	7	7	186,994	76	51,774	5,467	19,761	183,333
1924.....	8	8	156,095	89	65,512	5,260	(a)	139,965
1925.....	8	8	154,733	62	55,466	5,408	(a)	126,490
1926.....	8	8	358,342	102	90,069	9,716	(a)	152,433
1927.....	9	9	433,810	132	107,603	10,279	(a)	132,552

(a) Data not available.

Table 314.—Capital Employed in the Natural Abrasives Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	255,730	307,549
Cost of supplies and stocks on hand.....	43,305	49,323
Cash, trading and operating accounts and bills receivable.....	59,307	76,938
Total.....	358,342	433,810

Table 315.—Wage-Earners in the Natural Abrasives Industry in Canada, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	15	32	July.....	172	192
February.....	15	16	August.....	145	186
March.....	13	21	September.....	111	128
April.....	29	50	October.....	72	113
May.....	92	122	November.....	52	71
June.....	163	197	December.....	24	37

Table 316.—Fuel and Electricity Used in the Natural Abrasives Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Canadian.....	Ton	663	5,150	886	5,940
Wood.....	Cord	722	2,611	662	2,384
Electricity.....	K. W. H.	74,000	1,955	74,000	1,955
Total.....			9,716		10,279

Table 317.—Power Employed in the Natural Abrasives Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	12	410	11	390
Gasoline, gas and oil engines.....	1	5	1	5
<i>Total primary power.....</i>	<i>13</i>	<i>415</i>	<i>12</i>	<i>395</i>
Electric motors run by purchased power.....	6	241	6	241
Total power employed.....	19	656	18	636
Boilers.....	11	475	11	490

Table 318.—Production of Corundum in Canada, 1900-1927

(Short tons)

Year	Corundum-bearing rock treated	Grain corundum graded	Per cent recovery	Shipments of grain corundum				Average price in cents per pound
				Sold in Canada	Exported	Total shipments	Total value	
	Tons	Tons		Tons	Tons	Tons	\$	
1900.....		60		3		3	300	5.00
1901.....	4,134	434	10.7	85	302	387	46,415	5.97
1902.....	7,996	805	10.1	106	662	768	84,465	5.49
1903.....	(a) 8,877	839	9.5	85	618	703	77,510	5.51
1904.....	28,187	1,654	5.9	116	877	993	109,545	5.51
1905.....	23,571	1,681	7.1	140	1,504	1,644	149,153	4.48
1906.....	45,719	2,914	6.4	162	2,112	2,274	204,973	4.50
1907.....	60,532	2,682	4.4	164	1,728	1,892	177,922	4.70
1908.....	2,678	106	4.0	99	990	1,089	100,398	4.60
1909.....	35,894	1,579	4.4	129	1,362	1,491	162,492	5.45
1910.....	37,183	1,686	4.5	106	1,764	1,870	198,680	5.31
1911.....	41,975	1,641	3.9	92	1,380	1,472	161,873	5.50
1912.....	36,879	1,620	4.4	63	1,897	1,960	239,091	6.10
1913.....	12,290	763	6.2	23	1,154	1,177	137,036	5.82
1914.....	12,111	695	5.7	14	534	548	72,176	6.59
1915.....	1,724	116	6.7	21	241	262	33,138	6.33
1916.....	1,864	67	3.6	8	59	67	10,307	7.65
1917.....	4,659	188	4.0	16	172	188	32,153	8.55
1918.....	3,184	137	4.3		137	137	26,112	9.90
1919.....	1,300	26	2.0					
1920.....	(b) 13,025	322	2.5	20	176	196	24,547	6.25
1921.....	(b) 11,256	407	3.6		403	403	55,965	6.94
1922-1927.....								
Total.....	395,038	20,422		1,452	18,072	19,524	2,104,251	

(a) In addition to this amount which was milled in Canada, 267 tons of ore were mined and shipped to the United States for treatment there.

(b) Tailings only.

Table 319.—Production of Diatomite in Canada, 1896-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1896	644	9,960	1907	30	225	1918	500	12,500
1897	15	150	1908	30	195	1919	565	11,300
1898	1,017	16,660	1909			1920	280	8,600
1899	1,000	15,000	1910	22	134	1921	341	11,268
1900	336	1,950	1911	20	122	1922	219	5,781
1901	850	15,300	1912	38	230	1923	130	3,250
1902	1,052	16,470	1913	620	12,138	1924	33	838
1903	835	16,700	1914	650	13,000	1925-1926		
1904	320	6,400	1915	317	12,119	1927	265	6,650
1905	300	3,600	1916	620	12,139			
1906			1917	600	18,000	Total	11,639	230,679

Table 320.—Production of Grindstones in Canada, by Provinces, 1886-1927

Year	Nova Scotia		New Brunswick		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1886	1,765	24,050	2,255	22,495	4,020	46,545
1887	1,710	25,020	3,582	38,988	5,292	64,008
1888	1,971	20,400	3,793	30,729	5,764	51,129
1889	712	7,128	2,692	23,735	3,404	30,863
1890	850	8,536	4,034	33,804	4,884	42,340
1891	1,980	19,800	2,499	22,787	4,479	42,587
1892	2,462	27,610	2,660	22,226	5,122	49,836
1893	2,112	21,000	2,368	15,979	4,481	36,979
1894	1,543	15,217	2,124	16,000	3,667	31,217
1895	1,400	14,000	1,995	16,652	3,395	30,652
1896	1,450	14,500	2,113	17,460	3,563	31,960
1897	1,407	17,500	3,065	23,240	4,472	40,740
1898	1,422	12,350	3,313	28,240	4,735	40,590
1899	1,377	10,300	2,735	24,965	4,112	35,265
1900	1,421	12,600	3,758	34,690	5,179	47,290
1901	358	3,200	3,676	34,075	4,034	37,275
1902	1,074	8,118	3,309	31,900	4,383	40,018
1903	1,337	9,562	4,086	36,900	5,423	46,462
1904	1,029	7,332	3,480	33,490	4,509	40,822
1905	1,020	10,200	4,440	49,700	5,460	59,900
1906	1,023	9,680	4,282	48,634	5,305	58,314
1907	551	4,480	4,833	54,396	5,384	58,876
1908	473	4,803	3,185	37,250	3,658	42,053
1909	312	3,204	3,690	43,170	4,002	46,374
1910	387	3,496	3,400	38,000	3,787	41,496
1911	380	3,382	3,952	43,450	4,332	46,832
1912	374	3,760	3,830	42,700	4,204	46,460
1913	350	4,900	3,658	40,400	4,008	45,300
1914	350	5,270	3,433	43,577	3,783	48,847
1915	285	5,300	1,994	26,667	2,279	31,967
1916	273	5,800	2,950	44,175	3,222	49,975
1917	375	9,875	1,794	28,827	2,169	38,702
1918	256	8,000	2,550	62,745	2,806	70,745
1919	283	9,000	1,648	47,344	1,931	56,344
1920	211	8,440	2,051	65,679	2,262	74,119
1921	183	6,990	881	33,647	1,064	40,637
1922	102	3,692	735	26,600	837	30,292
1923	254	7,906	1,463	43,577	1,717	51,483
1924	338	12,525	1,693	56,586	2,031	69,111
1925	439	16,723	1,296	45,061	1,735	61,784
1926	311	15,136	1,202	43,850	1,513	55,986
1927	11	220	1,306	47,255	1,317	47,475
Total	35,921	441,005	117,812	1,521,645	153,733	1,962,650

Table 321.—Production of Pulpstones, Sharpening Stones, and Polishing Grit in Canada, 1892-1927

Year	Pulpstone		Sharpening stones		Polishing grit	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1892.....	60	900			101	450
1893.....	120	1,400				
1894.....	90	1,500				
1895.....	80	1,280				
1896.....	60	900			90	450
1897.....	100	1,600				
1898.....	200	3,200	33	985		
1899.....	375	7,000	24	1,000		
1900.....	360	6,160				
1901.....	547	8,415				
1902.....	250	4,100				
1903.....	115	1,840				
1904.....	140	1,960				
1905.....	68	1,875	12	600		
1906.....	40	600	18	900		
1907.....			30	1,500		
1908.....	158	4,725	27	1,350		
1909.....	240	6,640	33	1,650		
1910.....	125	3,700	36	1,800	25	200
1911.....	160	3,960	54	2,000	20	150
1912.....	125	4,000	38	1,300	45	330
1913.....	100	3,400	74	2,425	20	200
1914.....	40	4,000	115	1,254	38	403
1915.....			281	3,615	20	186
1916.....			224	2,614	22	193
1917.....	47	2,750	307	4,302		
1918.....	180	8,400	56	3,500	30	360
1919.....	14	420	45	3,392	30	360
1920.....	125	10,000	56	3,987	1	30
1921.....	200	22,000	17	1,430		
1922.....	150	12,000	13	1,450		
1923.....	260	25,100	35	3,500		
1924.....	624	58,113	36	3,600		
1925.....	781	57,781	46	4,600		
1926.....	1,155	89,541	27	2,700		
1927.....	911	75,242	23	2,300		
Total.....	8,609	434,502	1,665	57,751	442	3,312

Table 322.—Production of Grindstones, Pulpstones and Scythstones, by Provinces, in Canada, 1925-1927

Province	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Nova Scotia.....	439	16,723	311	15,136	11	220
New Brunswick.....	1,642	79,661	1,684	90,975	1,860	97,197
British Columbia.....	481	27,781	700	45,116	380	27,600
Total.....	2,562	124,165	2,695	151,227	2,251	125,017

Table 323.—Imports into Canada and Exports of Abrasives, 1925-1927

Item	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
IMPORTS—		\$		\$		\$
Abrasives—						
Artificial abrasives in bulk, crushed or ground, when imported for use in the manufacture of abrasive wheels and polishing composition.....		123,651		230,933		216,174
Carborundum wheels or stones not further manufactured than moulded and burned.....				158,448		131,428
Diamond dust or bort, and black diamonds for borers.....		694,405		963,141		1,396,122
Emery in bulk, crushed or ground.....		223,598		53,384		46,649
Emery wheels and carborundum wheels, n.o.p.....		198,432		77,331		56,916
Emery or carborundum, manufactures of, including carborundum stones, n.o.p.....		59,775		67,710		76,987
Grindstones, not mounted, and not less than 36 inches in diameter.....		641,369		791,412		815,257
Grindstones, n.o.p.....		19,983		36,838		96,451
Pumice and pumice stone, lava and calcareous tufa, not further manufactured than ground.....		27,581		32,005		35,211
Sand paper, glass, flint and emery paper or emery cloth.....		305,042		344,987		348,652
Iron sand or globules for polishing and sawing.....		11,702		17,464		12,052
Burrstones in olocks, rough or unmanufactured, not bound up or prepared for binding into mill-stones..... No.	5	584	3	450	3	450
Total		2,306,122		2,774,103		3,232,349
EXPORTS—						
Grindstones, manufactured.....		61,429		75,374		50,866
Stone for the manufacture of grindstones..... tons	93	794				
Abrasives—						
Natural, n.o.p..... cwt.	464	464	860	860	5,516	6,426
Artificial, crude, including carborundum..... cwt.	955,184	2,978,639	1,055,592	2,908,320	1,000,321	2,645,347
Artificial, made up into wheels, stones, etc.....		32,030		45,802		38,463
Total		3,073,356		3,030,356		2,741,102

ASBESTOS

CANADA

Asbestos was discovered in the Des Plantes river region, between St. Joseph and St. Francis villages, Quebec, about 1862. Exploitation of these deposits was found however, to be unprofitable owing to their limited character.

The next discovery of asbestos was made in the district of Thetford and Coleraine in 1877. In the following year mining was commenced on a small scale and some fifty tons were produced. The fibre produced was excellent but it was difficult to find a market.

In the course of the next twelve years developments in the industry were rapid. Seven quarries were in operation in 1885 and the exports during that year totalled 2,440 tons. First quality asbestos sold for \$80 per ton; however, a gradual increase in price was recorded and in 1900 when the total production was 29,141 tons this grade brought \$300 per ton. Production in 1910 advanced to 102,215 tons; employees numbered 3,693 with total wages of \$1,528,544. In 1920, there were 18 mines in operation, the quantity sold was 199,573 tons valued at \$14,792,201 employees totalled 3,572 and wages paid were \$4,765,305.

The 1927 shipments amounted to 274,778 tons with a valuation of \$10,621,013. Asbestos rock mined during the year totalled 4,834,761 tons, of which quantity 3,820,024 tons were handled by the mills.

Exports of asbestos (including sand and waste) in 1927, totalled 262,290 tons. Shipments to Great Britain amounted to 14,496 tons, to the United States 196,308 tons, to Germany, 19,829 tons., and smaller tonnages to Australia, Belgium, France, Italy, Japan and the Netherlands.

Production of asbestos in South Africa and Cyprus increased in 1927 the former country shipping 22,133 tons and the latter, 12,544 tons. The Rhodesian output declined slightly from 33,344 tons in 1926 to 33,176 tons in 1927. Mine operators in the United States shipped 2,986 tons during the year under review.

In the asbestos mining industry in Canada in 1927 the capital employed by the seven producing firms was reported at \$35,316,821. Employment was furnished 141 salaried employees, 1,707 mine workers and 1,128 mill workers; their combined earnings amounted to \$3,761,192. A ten hour day was usual throughout most of the field. Fuel and electricity cost \$1,046,541, including \$632,429 for 60,900,833 kilowatt hours of electricity. The 398 electric motors in use during the year had a total rating of 31,579 h.p.

Ten plants in Canada manufacture asbestos products including the following commodities; asbestos paper and mill board; asbestos roofing of all kinds; asbestos rigid shingles; asbestos building materials; asbestos cellular, and sponge-felted pipe insulation; insulating sheets and blocks; asbestos brake linings and clutch facings (woven on special looms); and asbestos packings for steam, oil and hydraulic operations.

The eastern townships area in the province of Quebec supplies about 85 per cent of the world's production of asbestos. Rhodesia, the second producer, markets only the longer fibre stocks, and is therefore an important competitor, as Canadian mines ship both long and short fibre. The Union of South Africa and Russia have also become more important sources of supply, particularly to European markets. In South Africa, the Transvaal production consists principally of chrysotile, although small quantities of amosite (long fibre), and crocidolite (blue) are also produced; the Cape production is exclusively crocidolite. Cyprus, Italy, the United States, China and Australia also produce small tonnages of asbestos.

One of the most valuable developments in the asbestos industry was brought about by the incorporation of a new company which merged many of the segregated operators in Quebec. The Asbestos Corporation, Ltd., obtained a federal charter in November, 1924, under which it acquired control of the following companies: Asbestos Corporation of Canada, Limited; Consolidated Asbestos Limited (owning the Thetford, Belmina, and Berlin mines); Federal Asbestos Company Limited; Asbestos Mines, Ltd., Thetford-Vimy Limited; Maple Leaf Asbestos Corporation, Limited; and the Black Lake Asbestos and Chrome Company, Limited. The provisions of this charter, which became operative on January 1, 1926, give the company power to conduct operations throughout Canada.

Table 324.—Production of Asbestos in Canada, 1880-1927

Year	Short tons	Value	Year	Short tons	Value	Year	Short tons	Value
		\$			\$			\$
1880*	380	24,700	1897.....	30,442	445,368	1914.....	117,573	2,909,806
1881*	540	35,100	1898.....	23,785	491,197	1915.....	136,842	3,574,985
1882*	810	52,650	1899.....	25,536	485,849	1916.....	154,149	5,228,869
1883*	955	68,750	1900.....	29,141	748,431	1917.....	153,781	7,230,383
1884*	1,141	75,097	1901.....	40,217	1,259,759	1918.....	158,259	8,970,797
1885*	2,440	142,441	1902.....	40,416	1,148,319	1919.....	159,236	10,975,369
1886*	3,458	206,251	1903.....	41,677	929,757	1920.....	199,573	14,792,201
1887.....	4,619	226,976	1904.....	48,465	1,226,352	1921.....	92,761	4,906,230
1888.....	4,404	255,007	1905.....	68,263	1,503,259	1922.....	163,706	5,552,723
1889.....	6,113	426,554	1906.....	82,185	2,060,143	1923.....	231,482	7,522,506
1890.....	9,860	1,260,240	1907.....	90,426	2,505,042	1924.....	225,744	6,710,830
1891.....	9,279	999,878	1908.....	90,773	2,573,335	1925.....	273,524	8,977,546
1892.....	6,082	390,462	1909.....	87,300	2,301,775	1926.....	279,403	10,099,423
1893.....	6,331	310,156	1910.....	102,215	2,573,603	1927.....	274,778	10,621,013
1894.....	7,630	420,825	1911.....	127,414	2,943,108			
1895.....	8,756	368,175	1912.....	136,301	3,137,279			
1896.....	12,250	429,856	1913.....	161,086	3,849,925	Total.....	3,931,501	143,948,300

*Exports—

Table 325.—Output and Shipments of Canadian Asbestos, 1926 and 1927

Classification	1926				1927			
	Total output	Sold or shipped			Total output	Sold or shipped		
		Quantity	Total sales value at mill	Average value per ton		Quantity	Total sales value at mill	Average value per ton
Tons	Tons	\$	\$ cts.	Tons	Tons	\$	\$	
Crude No. 1.....	842	1,108	410,373	370 37	527	1,107	468,980	423.65
Crude No. 2.....	2,952	3,494	802,304	229 62	2,835	3,014	752,277	249.59
Other crudes.....	328	446	92,394	207 16	370	667	151,231	226.73
Spinning stocks.....	13,839	15,182	1,885,835	124 21	12,273	14,348	1,855,425	129.32
Shingle stocks.....	39,678	36,497	2,139,780	58 62	45,784	44,573	2,889,124	64.81
Mill board and paper stocks....	101,293	86,746	2,940,675	33 89	59,490	60,396	2,284,021	37.82
Fillers, floats and other short fibres.....	141,272	135,930	1,828,062	13 44	148,430	150,673	2,219,955	14.73
Total.....	300,204	279,403	10,099,423	36 15	269,709	274,778	10,621,013	38.65
Sand and gravel*.....	15,672	15,672	10,257	0 65	20,280	20,280	12,407	0.61

* This production has been included under the "Sand and Gravel Industry."

Table 326.—Imports of Asbestos into Canada, 1925-1927

Item	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Asbestos in any form other than crude, and all manufactures of, n.o.p.....		350,600		472,513		562,794
Asbestos packing.....	111	98,169	93	93,122	114	109,088
Total.....		448,769		565,635		671,882

Table 327.—Exports of Canadian Asbestos by Countries of Destination, 1925-1927

Commodity and Destination	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
ASBESTOS—						
Great Britain.....	6,846	608,774	7,710	575,866	11,673	818,858
United States.....	94,292	4,979,303	92,897	5,295,168	75,930	4,706,247
Australia.....	1,360	94,272	1,605	116,250	1,697	119,965
Belgium.....	6,002	370,530	10,033	628,981	8,068	540,655
France.....	5,484	438,195	6,860	481,145	5,486	409,840
Germany.....	8,947	737,802	12,537	900,104	16,317	1,223,768
Italy.....	3,730	260,263	3,671	242,482	3,687	246,633
Japan.....	7,127	373,312	4,518	250,714	7,553	402,075
Netherlands.....	2,707	212,855	1,723	167,050	2,533	209,290
Spain.....	130	7,800			22	1,210
Other countries.....	125	7,000	206	12,050	259	18,835
Total.....	136,750	8,090,106	141,760	8,669,810	133,225	8,697,376
SAND AND WASTE—						
Great Britain.....	1,863	34,490	1,594	35,767	2,823	65,479
United States.....	115,587	1,490,341	131,437	1,889,003	120,378	1,830,728
Other countries.....	3,817	67,455	3,200	67,710	6,864	141,728
Total.....	121,267	1,592,286	136,231	1,992,480	130,065	2,037,935
ASBESTOS MANUFACTURES INCLUDING ASBESTOS ROOFING—						
Great Britain.....		272		4,793		7,479
United States.....		32,443		19,118		18,599
British South Africa.....		5,855				831
France.....		205				
Newfoundland.....		9,048		6,371		5,383
New Zealand.....		31		1,247		859
Other countries.....		7,718		11,482		33,183
Total.....		55,572		43,011		66,334

Table 328.—Monthly Average Prices of Asbestos by Grades, 1926 and 1927

(Per short ton)

(Computed from quotations in the *Engineering and Mining Journal*)

Month	Crude No. 1	Crude No. 2	Spinning fibres	Magnesia and compressed sheet fibres	Shingle stock	Paper stock	Cement stock	Short fibres	Floats
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1926									
January.....	500	300	190	125	73	42	25	15	15
February.....	525	313	183	137	70	43	25	15	15
March.....	525	300	190	137	70	43	25	15	15
April.....	525	300	190	137	70	43	25	15	15
May.....	525	300	190	137	70	43	25	15	15
June.....	525	300	190	137	70	43	25	15	15
July.....	525	300	190	137	70	43	25	15	15
August.....	525	300	190	137	70	43	25	15	15
September.....	525	300	190	137	70	43	25	15	15
October.....	525	300	190	137	70	43	25	15	15
November.....	525	300	190	137	70	43	25	15	15
December.....	525	300	190	137	80	43	25	15	15
Average.....	533	301	190	136	71	43	25	15	15
1927									
January.....	525	300	190	137	80	43	25	15	15
February.....	525	325	200	137	80	43	25	15	15
March.....	525	325	200	137	80	43	25	15	15
April.....	525	325	200	145	75	43	25	15	15
May.....	525	325	200	145	75	43	25	15	15
June.....	525	325	200	145	75	43	25	15	15
July.....	525	325	200	145	75	43	25	15	15
August.....	525	325	200	145	75	43	25	15	15
September.....	575	375	225	175	93	45	25	15	15
October.....	575	375	225	160	93	45	25	15	15
November.....	575	375	225	160	93	45	25	15	15
December.....	650	450	225	168	100	48	25	15	15
Average.....	548	346	208	150	83	44	25	15	15

Table 329.—Principal Statistics of the Asbestos Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	14	16	42,715,557	3,165	3,607,178	920,826	2,524,610	7,522,506
1924.....	15	15	43,216,966	2,597	2,977,304	760,046	2,173,991	6,710,830
1925.....	14	19	38,133,046	2,582	2,997,107	923,239	(a)	8,988,360
1926.....	8	16	34,905,096	2,797	3,544,097	1,012,232	(a)	10,109,680
1927.....	7	13	35,316,821	2,976	3,761,192	1,046,541	(a)	10,633,420

(a) Data not available.

Table 330.—Capital Employed in the Asbestos Industry in Canada, 1925-1927

	1925	1926	1927
	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—			
Cost of lands, buildings, machinery and tools.....	33,066,779	30,343,961	30,837,295
Cost of supplies and stocks on hand.....	1,907,057	2,117,598	1,686,084
Cash, trading and operating accounts and bills receivable.....	3,159,210	2,443,537	2,793,442
Total.....	38,133,046	34,905,096	35,316,821

Table 331.—Employees, Salaries and Wages in the Asbestos Industry in Canada, 1926 and 1927

	1926				1927			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried Employees.....	129	12	141	328,813	129	12	141	349,434
Wage-Earners—								
Mine.....	1,521		1,521		1,707		1,707	
Mill.....	1,135		1,135		1,128		1,128	
Total.....	2,656		2,656	3,215,284	2,835		2,835	3,411,758
Grand total.....	2,785	12	2,797	3,544,097	2,964	12	2,976	3,761,192

Table 332.—Wage-Earners in the Asbestos Industry in Canada by Months, 1926 and 1927

Month	1926		1927		Month	1926		1927	
	Mine	Mill	Mine	Mill		Mine	Mill	Mine	Mill
January.....	1,256	873	1,530	957	July.....	1,518	1,109	1,635	1,104
February.....	1,410	1,153	1,587	934	August.....	1,556	1,099	1,751	1,200
March.....	1,463	1,123	1,663	1,026	September.....	1,597	1,148	1,835	1,203
April.....	1,410	1,124	1,601	1,052	October.....	1,601	1,188	1,800	1,230
May.....	1,535	1,161	1,698	1,123	November.....	1,625	1,217	1,778	1,217
June.....	1,558	1,130	1,728	1,133	December.....	1,530	1,178	1,772	1,208

Table 333.—Fuel and Electricity Used in the Asbestos Industry in Canada, 1926 and 1927

Kind	Unit of Measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	15,397	104,518	14,538	98,755
Bituminous coal { Canadian.....	Ton	44,590	282,816	21,395	157,547
{ Imported.....	Ton			18,683	137,795
Coke.....	Ton	2,128	23,888	1,557	18,965
Kerosene or coal oil.....	Imp. gal.			5,000	1,050
Wood.....	Cord	50	150		
Electricity.....	K.W.H.	64,462,880	600,860	60,900,833	632,429
Total.....			1,012,232		1,046,541

Table 334.—Power Employed in the Asbestos Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	4	1,050	5	1,120
Gasoline, gas and oil engines.....	1	6	1	6
Total primary power.....	5	1,056	6	1,126
Electric motors run by purchased power.....	404	27,433	398	31,579
Total power employed.....	409	28,489	404	32,705
Electric motors run by primary power in same plant.....	5	700		
Total electric motors.....	409	28,153	398	31,579
Boilers.....	18	1,820	6	465

Table 335.—*World Production of Asbestos, 1913 and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
Canada ¹	118,361	206,680	201,557	259,275	249,467	245,337
Southern Rhodesia ²	259	18,182	23,340	30,669	29,771	29,421
Union of South Africa ²	859	7,312	6,450	9,078	12,586	19,762
Australia ²		217	74	51	109	11
Cyprus ² (exports).....	1,168	2,151	3,903	3,221	6,197	11,200
India ²		247	125	16	80	68
Total.....	120,647	234,789	235,458	302,310	298,210	305,999
FOREIGN COUNTRIES						
China ²		126	125	213	(a)	(a)
Finland ²		774	1,207	1,700	2,063	2,385
Italy ²	172	1,513	2,125	2,071	2,500	(a)
Russia ²	17,218	4,801	8,197	10,000	18,000	20,822
United States ³	982	202	268	1,123	1,212	2,666
France ²		653	868	654	600	(a)
Japan ²		369	277	1,155	(a)	(a)
Total.....	18,372	8,438	13,067	16,916	24,375	25,873
Grand total.....	139,019	243,227	248,525	319,226	322,585	331,872

*Source—

¹Dominion Bureau of Statistics, Canada.²Prior to 1923 Imperial Institute publications, later, figures from official reports of the different countries.³Mineral Resources of the United States.

(a) Data not available.

FELDSPAR

CANADA

The first record of production in the feldspar industry in Canada dates back to about the year 1890. The production during that year was approximately 700 tons and since that date an increase has been recorded until in 1924 the maximum output for the industry, namely, 44,804 tons, was produced.

The initial development work in this industry was made on deposits located in Villeneuve, Templeton and Hull townships, in the province of Quebec. In the townships of Bedford and Portland, Ontario, near Bedford and Verona, development work was started on large feldspar deposits in the year 1900. From December, 1900, to March, 1901, shipments from this district amounted to 4,000 tons, all of which were made to the United States for consumption in the pottery industry. The activities of these Ontario feldspar properties during the next few years, owing to their proximity to the United States market (potteries located in New Jersey), were responsible for the almost complete cessation of work on Quebec deposits.

Small quantities of feldspar were produced in Quebec from 1909 to 1915, while during that period Ontario deposits shipped amounts varying from 12,686 tons to 17,962 tons. In 1916, the Quebec production rose to 4,610 tons, there was a considerable falling off during the following four years, however from 1921 to 1926 shipments have been large ranging from a minimum of 9,737 tons in 1921 to a maximum of 16,147 tons in 1924. Dental spar has been produced in small quantities from the Villeneuve quarry in Portland township, Quebec, for a number of years.

Ontario producers during the period 1901 to 1927, inclusive, contributed 83 per cent of the total Canadian production. The minimum output for the period was in 1901 when 4,816 tons were shipped; the high mark of 37,224 tons was reached in 1920.

Plants for the fine-grinding of feldspar in Canada are located at Kingston, Toronto and Oshawa; the Kingston plant was operated during 1927 producing about 2,400 tons of ground spar.

Although feldspar occurs in many deposits throughout Canada, operations in this industry in 1927 were confined to the provinces of Ontario and Quebec. With the exception of some 2,400 tons used for domestic purposes, the entire Canadian output was shipped to United States grinding plants in the form of crude spar for use in the ceramic industry.

The total capital employed by the 29 firms operating in this industry was reported at \$322,978. Employment statistics showed 7 salaried employees and 227 wage-earners on the payroll during the year; their earnings totalled \$151,553. Fuel used by the operators in 1927 cost \$10,232.

Table 336.—Production of Feldspar in Canada, by Provinces, 1890-1927

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1890.....	700	3,500			700	3,500
1891.....	685	3,425			685	3,425
1892.....	175	525			175	525
1893.....	575	4,525			575	4,525
1894.....						
1895.....					1,018	2,545
1896.....	972	2,583			972	2,583
1897.....	1,400	3,290			1,400	3,290
1898.....	2,500	6,250			2,500	6,250
1899.....	3,000	6,000			3,000	6,000
1900.....	155	542			318	1,112
1901.....	534	1,068	163	570	5,350	10,700
1902.....			4,816	9,632	7,376	15,152
1903.....	18	32	7,576	15,152	13,928	18,966
1904.....			13,910	18,934	11,083	22,166
1905.....			11,083	22,166	11,700	23,400
1906.....			11,700	23,400	16,948	40,890
1907.....			16,948	40,890	12,584	29,819
1908.....			12,584	29,819	7,877	21,099
1909.....			7,877	21,099	12,783	40,383
1910.....	97	1,719	12,686	38,664	15,809	47,667
1911.....	90	1,800	15,719	45,867	17,723	51,939
1912.....	17	255	17,706	51,684	13,733	30,916
1913.....	100	2,000	13,633	28,916	16,790	60,795
1914.....	74	1,554	16,716	59,241	18,060	70,824
1915.....	98	2,156	17,962	68,668	14,559	57,801
1916.....	572	2,005	13,987	55,796	19,488	71,407
1917.....	4,610	18,075	14,878	53,332	18,782	112,728
1918.....	1,188	8,204	18,274	81,622	18,782	89,826
1919.....	191	4,279	18,591	108,449	14,679	280,895
1920.....	925	13,073	13,754	73,158	27,727	230,754
1921.....	649	10,052	37,224	270,843	29,225	248,402
1922.....	9,737	80,180	20,115	150,457	44,804	358,540
1923.....	12,472	127,826	15,255	120,576	28,681	355,789
1924.....	12,026	102,779	17,199	134,822	35,951	310,238
1925.....	16,147	142,118	28,657	216,422	29,849	259,151
1926.....	11,287	94,730	17,394	141,059		
1927.....	13,168	111,136	22,783	199,102		
1927.....	12,730	104,618	17,119	154,533		
Total.....	106,892	860,299	436,309	2,234,873	544,235	3,097,834

*Exports.

†Includes Nova Scotia production—16 tons valued at \$117.

Table 337.—Production in Canada, Imports and Exports of Feldspar, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	11,287	94,730	13,168	111,136	12,730	104,618
Ontario.....	17,394	141,059	22,783	199,102	17,119	154,533
Total.....	28,681	235,789	35,951	310,238	29,849	259,151
IMPORTS.....	1,570	31,114	2,441	45,975	3,040	50,875
EXPORTS.....	28,659	209,164	33,016	251,551	28,648	225,955

Table 338.—Principal Statistics of the Feldspar Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	25	25	948,973	298	193,001	13,965	55,542	237,601
1924.....	25	25	953,525	290	223,937	16,866	(a)	358,540
1925.....	23	25	712,329	240	165,766	11,141	(a)	235,789
1926.....	29	30	582,350	410	213,571	14,654	(a)	310,238
1927.....	29	29	322,978	234	151,553	10,232	(a)	259,151

(a) Date not available.

Table 339.—Capital Employed in the Feldspar Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	511,416	245,833
Cost of supplies and stocks on hand.....	37,550	29,801
Cash, trading and operating accounts and bills receivable.....	33,354	47,289
Total.....	582,350	322,978

Table 340.—Employees, Salaries and Wages in the Feldspar Industry in Canada, 1926 and 1927

	1926				1927			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	12	1	13	18,450	7	.....	7	11,643
Wage-earners.....	397	.....	397	195,121	227	.....	227	139,910
Total.....	409	1	410	213,571	234	.....	234	151,553

Table 341.—Wage-Earners in the Feldspar Industry in Canada, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	283	151	July.....	311	216
February.....	261	152	August.....	337	209
March.....	223	163	September.....	250	211
April.....	170	143	October.....	304	199
May.....	167	215	November.....	251	182
June.....	288	209	December.....	233	180

Table 342.—Fuel and Electricity Used in the Feldspar Industry in Canada, 1926 and 1927

Kind	Unit of Measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Imported.....	Ton	935	8,444	540	4,837
Gasoline.....	Imp. gal.	7,546	2,357	5,603	1,505
Wood.....	Cord	917	3,853	1,016	3,890
Total.....			14,654		10,232

Table 343.—Power Employed in the Feldspar Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	6	248	6	163
Gasoline, gas and oil engines.....	5	95	4	50
<i>Total primary power.....</i>	<i>11</i>	<i>343</i>	<i>10</i>	<i>213</i>
Boilers.....	12	433	10	376

Table 344.—*World Production of Feldspar, 1913 and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
United Kingdom (b).....	66,626	54,589	55,756	57,379	47,769	63,612
Canada.....	14,991	26,094	40,003	25,608	32,099	26,651
Australia.....		33	15	32	114	103
Union of South Africa.....					99	29
Total.....	81,617	80,716	95,774	83,019	80,081	90,400
FOREIGN COUNTRIES						
Finland.....		778	659	788	595	544
Germany (Bavaria).....	(a)	8,851	32,605	10,093	6,553	7,202
Italy.....		4,989	3,200	2,500	5,783	3,980
Japan.....	(a)	22,571	23,050	18,743	(a)	(a)
Norway (Exports).....	40,186	12,863	20,530	26,355	20,180	27,206
Rumania.....					1,662	1,912
Russia (fiscal years Sept. 30th).....	(a)	(a)	(a)	8,477	18,346	19,019
Sweden.....	37,260	16,003	18,999	26,321	33,000	28,789
United States.....	107,996	145,004	204,772	185,706	209,988	202,497
Total.....	185,451	211,064	303,815	278,983	293,107	291,158
Grand total.....	267,068	291,780	399,589	362,002	376,188	381,558

* Source—

Prior to 1925 Imperial Institute publications. Data for 1925 and 1926 obtained directly from statistical bureaus of the different countries.

(a) Data not available.

(b) Including China Stone

GRAPHITE

CANADA

The first operations in the graphite industry in Canada were carried on in the province of Quebec in 1846, when a deposit of crystalline graphite was worked in Grenville township. During 1869 an estimated value of \$72,000 was placed on shipments of graphite from New Brunswick and Quebec. Ten years later exports from Canada were valued at \$1,167. The demand for Canadian graphite during the war years had its peak in 1916 and the production in that year amounted to 3,955 tons valued at \$325,362. The six plants in operation employed 344 men, whose wages totalled \$191,876. Although the 1917 tonnage was 241 tons less than that of the preceding year, the value received by the operators was considerably higher, the total being \$402,892. No. 1 flake graphite sold for an average of \$293.80 per ton in 1917; No. 2 flake, \$153.26 per ton; and amorphous and dust, \$57.30 a ton. During 1927 shipments of graphite were reported by two producers, their total production amounting to 1,829 tons worth \$111,656.

Exports of graphite, crude or refined, in 1927, according to Custom's records, totalled 1,699 tons appraised at \$102,476 as compared with 2,564 tons at \$180,851 exported in 1926.

NEW BRUNSWICK

The deposits of amorphous graphite at Split Rock and Marble Cove, Lancaster parish, St. John county, New Brunswick, were worked as early as 1853; the output for that year being 45 tons. These workings were inactive until 1868 when they were re-opened. In 1869 the production of graphite in New Brunswick was valued at \$12,000; the value of plant and machinery was placed at \$700; and there were 10 men employed. From 1885 to 1888 the annual production ranged from 100 tons to 400 tons. Operations on a deposit at Marble Cove were commenced by the Canada Paint Company in 1895 and continued until 1908. There has been no production of graphite in New Brunswick since that date.

QUEBEC

Operations in the graphite industry in Quebec date back to 1846 when a deposit was opened up in Grenville township. During the three-year period 1869-1871, a property in Buckingham township was operated with an average production of 450 tons; employment was furnished 18 men during this period. From 1888 to 1899, operations were carried on intermittently in Buckingham township, however, from that date to 1906 little work was done on these deposits. In 1916, mills at Buckingham and St. Rémi d'Amherst, shipped 479 tons. During 1925, three Quebec companies reported a total production of 359 tons, in 1926 the two operators produced 326 tons and in 1927 the one active firm shipped 34 tons.

ONTARIO

Mining and milling of graphite in Ontario had its inception in 1870 when the Port Flmsley deposit was opened up and the Oliver's Ferry refining plant was constructed. A deposit in Bedford township was operated prior to 1890 and a small quantity of crystalline graphite was produced. In 1896 another producer commenced operations, namely, the Black Donald Company. This deposit is located near Calabogie in Renfrew county and is the largest and richest body of graphite known in North America. Operations have been practically continuous since the opening up of this property. The graphite is shipped as a refined product, the higher grades which are used in lubricating compounds, being 90 to 99 per cent pure. These products are used principally in lubricants, foundry facings, stove polishes and in the manufacture of paints for iron and steel structural work. In 1919 the N. A. Timmins deposit in North Burgess township was opened up. The Ontario production in 1925 of 2,210 tons came from three deposits; the Black Donald, the Globe, and the Timmins, however, in 1926 and 1927 only the first named was in operation.

BAFFIN ISLAND

Graphite has been recorded from time to time as being found at various localities on Baffin island. Thus, R. Bell records the receiving of specimens at Black Lead island, Cumberland Sound, in 1897, and in 1885 from Eskimos at Ashe inlet, on Big Island. In the latter case, the

specimens are said to have come from a point east of Big Island, and were possibly found in the neighbourhood of Lake Harbour. A. P. Low, also, mentions veins of graphite occurring south of Port Burwell, on the east shore of Ungava bay, and near Cape Wolstenholme, as well as on the east side of Baffin island.

In 1916, the Hudson Bay Company commenced the development of a graphite deposit near Lake Harbour on the south shore of Baffin island, behind Big Island, and in 1917 and 1918 shipped out a small tonnage. The graphite is of crystalline or vein variety, and requires only to be hand cobbled in order to fit it for market. The veins, of which several have been worked, occur in crystalline limestone, probably of Grenville age, on its contact with intrusive quartz dikes. The graphite secured was shipped to a crucible firm, who report its quality as equal to the best grade of Ceylon plumbago.*

Table 345.—Production of Graphite in Canada, by Provinces, 1886-1927

Year	New Brunswick		Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
1886.....	500	4,000					500	4,000
1887.....	300	2,400					300	2,400
1888.....	150	1,200					150	1,200
1889.....	200	1,600	42	1,560			242	3,160
1890.....	150	1,200	25	4,000			175	5,200
1891.....	260	1,560					260	1,560
1892.....			167	3,763			167	3,763
1893.....								
1894.....			5	400			5	400
1895.....	150	900	70	5,250			220	6,150
1896.....	45	315	94	9,140	650	13,000	789	22,455
1897.....	89	890	247	12,350	100	3,000	436	16,240
1898.....	260	2,600	100	5,098	300	6,000	660	13,698
1899.....			90	8,000	1,220	16,179	1,310	24,179
1900.....	120	1,440	302	5,600	1,500	24,000	1,922	31,040
1901.....	240	2,880	220	4,400	1,750	31,500	2,210	35,780
1902.....	200	2,400	100	10,000	795	15,900	1,095	25,300
1903.....					728	23,745	728	23,745
1904.....	60	480	25	2,300	367	8,980	452	11,760
1905.....	60	480			481	16,255	541	16,735
1906.....			125	8,300	262	10,000	387	18,300
1907.....			120	5,000	459	11,000	579	16,000
1908.....	40	360	1	165	210	5,040	251	5,565
1909.....			134	10,176	730	37,624	864	47,800
1910.....			155	16,000	1,237	58,087	1,392	74,087
1911.....			374	33,084	895	36,492	1,269	69,576
1912.....			604	50,680	1,456	66,442	2,060	117,122
1913.....			103	9,620	2,059	80,662	2,162	90,282
1914.....			261	18,886	1,586	88,317	1,647	107,203
1915.....			75	5,431	2,560	118,792	2,635	124,223
1916.....			479	75,776	3,476	249,586	3,955	325,362
1917.....			541	106,305	3,173	296,587	3,714	402,892
1918.....			180	40,018	2,934	208,852	3,114	248,870
1919.....			20	400	1,340	99,821	1,360	100,221
1920.....			233	31,913	1,957	133,704	2,190	165,617
1921.....			38	2,423	899	63,439	937	65,862
1922.....			24	1,500	573	29,853	597	31,353
1923.....			45	2,316	1,068	65,557	1,113	67,873
1924.....			46	3,275	1,288	72,842	1,334	76,117
1925.....			359	30,900	2,210	127,863	2,569	158,763
1926.....			326	29,516	2,401	165,344	2,727	194,860
1927.....			34	2,043	1,795	109,613	1,829	111,656
Total.....	2,824	24,705	5,764	555,588	42,259	2,294,076	50,847	2,874,369

*Extract from "Graphite" by Hugh S. Spence.

Table 346.—Production in Canada, Imports and Exports of Graphite, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Ore milled.....	6,534		9,006		7,743	
Production.....	2,569	158,763	2,727	194,860	1,829	111,656
IMPORTS—						
Crucibles, plumbago.....		49,730		60,782		60,783
Plumbago, not ground or otherwise manufactured.....		772		3,836		1,457
Plumbago, ground and manufactures of, n.o.p.....		91,767		57,202		60,897
EXPORTS—						
Graphite or plumbago, crude or refined.	2,484	135,897	2,564	180,851	1,699	102,476

Table 347.—Principal Statistics of the Graphite Industry in Canada, 1923-1927

Year	Number of firms	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscel- laneous expenses	Selling value of products
		\$		\$	\$	\$	\$
1923.....	3	552,947	62	27,826	7,614	6,000	67,873
1924.....	4	647,947	75	55,449	12,163	30,000	76,117
1925.....	6	902,310	106	75,021	14,718	(a)	158,763
1926.....	3	1,132,273	68	63,064	10,804	(a)	194,860
1927.....		Included under Miscellaneous Non-Metal Mining Industries.					

(a) Data not available.

Table 348.—*World Production of Graphite, 1913 and 1923-1927

(Long tons)

	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
Canada.....	1,930	994	1,191	2,294	2,435	1,633
Australia.....			3			10
Ceylon.....	28,540	10,669	9,651	15,426	11,623	12,884
Union of South Africa.....	35	53	49	47	46	57
Total.....	30,505	11,716	10,894	17,767	14,104	14,584
FOREIGN COUNTRIES						
Austria.....	48,742	9,252	9,370	12,868	14,518	(a)
Czechoslovakia.....		9,714	11,743	18,169	30,323	40,464
France.....	1,175	187	506	1,121	(a)	(a)
Germany.....	11,900	20,521	9,917	16,582	14,075	(a)
Italy.....	10,966	5,600	7,616	9,777	9,451	7,182
Norway.....	295					(a)
Spain.....				1,914	593	(a)
Sweden.....	87					(a)
Russia.....	(a)	(a)	(a)	1,277	4,936	6,749
Greenland.....		59	52			(a)
Indo-China (French).....			2,228	218	801	405
Japan.....	654	788	755	994	491	623
Korea.....	12,080	14,417	14,708	13,852	15,504	(a)
Madagascar.....	6,212	10,595	12,837	12,796	15,647	12,794
Mexico.....	4,364	5,401	7,894	5,745	4,363	5,744
United States.....	4,263	5,391	4,438	4,165	4,884	4,644
Total.....	100,738	81,925	82,064	99,478	115,586	78,605
Grand total.....	131,243	93,641	92,958	117,245	129,690	93,189

*Source—Imperial Institute publications.

ARTIFICIAL GRAPHITE

Artificial graphite is manufactured in electric furnaces at Niagara Falls, Ontario, by the Acheson Graphite Company. The annual production over a period of fifteen years is shown in the following table:

Table 349.—Artificial Graphite made in Canada, 1913-1927

Year	Pounds	Year	Pounds	Year	Pounds
1913.....	2,184,472	1918.....	1,808,698	1923.....	1,554,376
1914.....	1,234,239	1919.....	358,524	1924.....	816,455
1915.....	497,271	1920.....	207,180	1925.....	1,291,311
1916.....	525,048	1921.....	376,508	1926.....	1,246,291
1917.....	1,096,172	1922.....	724,524	1927.....	1,291,311

GYPSUM

CANADA

Large deposits of gypsum occur throughout Canada. Quarries are operated in Hants, Inverness, and Victoria counties, Nova Scotia; near Hillsborough, Albert county, and Plaster Rock, Victoria county, New Brunswick; near Paris, Ontario; Gypsumville, Manitoba; and Canford, Falkland and Mayook, British Columbia.

The development of gypsum deposits in Nova Scotia took place during the period, 1779-1833, but the work was done mainly on a small scale by individual operators. In 1822, a gypsum deposit was opened up on the Grand river near Paris, Ontario, but at that early date the only use found for this product was for fertilizer. A mill was erected here in 1823 and operations have continued since that date. The exploitation of New Brunswick deposits dates back to 1847. In 1901, deposits in Manitoba were first opened up and appreciable quantities of gypsum have been extracted annually since then. Shipments from British Columbia deposits did not commence until 1911, and prior to 1926 the production was only nominal.

Production data are not available prior to 1886, but according to export records, 67,830 tons of gypsum were shipped from Canada in 1874. During 1886 the Canadian deposits produced 162,000 tons; from 1889 to 1900, shipments ranged from 192,000 tons to 250,000 tons. Ten years later, sales amounted to 525,246 tons and in 1925, the total was 740,323 tons.

Continuing the advance in gypsum production recorded in 1926, the shipments during 1927 created a new high mark for the industry in Canada. Increases in tonnages shipped were reported in all producing provinces except Ontario. The total production for the year amounted to 1,063,117 tons worth \$3,251,015 as compared with 883,728 tons at \$2,770,813 produced in 1926. The average values received by the operators in 1927 were as follows: lump, \$1.49; crushed, \$1.74; fine ground, \$6.27; and calcined, \$10.07 per ton.

Importations of gypsum, all grades, into Canada were recorded at 8,219 tons worth \$147,560 as against 6,298 tons with a valuation of \$119,141 imported in 1926.

Canadian crude gypsum exported, principally to the United States, amounted to 588,808 tons in 1927. Ground gypsum and prepared wall plaster exported during the year totalled 6,556 tons. United States, Newfoundland, Australia and New Zealand were the principal importers of these materials.

Capital employed in this important Canadian mining industry in 1927 was reported at \$9,055,624. Employment was furnished to 63 salaried employees, 973 mine workers and 391 mill workers; their combined earnings were \$1,311,688. The cost of fuel used during the year was \$137,939, while the electric power purchased meant a further outlay of \$60,260. Plant equipment included 145 electric motors with a combined rating of 4,912 h.p.

NOVA SCOTIA

Gypsum deposits have been known in Nova Scotia since the early settlement of the province. Although it is known that from 1779 to 1833, individual operators, mainly farmers, carried on quarrying operations, hauled out the crude rock and either sold it to local traders or chartered a small vessel to convey it to the United States, no data are available regarding the extent of these activities. Several attempts were made by local producers to work up the crude rock but these were not successful owing to the limited home consumption and the consequent almost total dependence on the United States markets. When the United States duty was made prohibitive, all local milling operations ceased. From 1861 to 1867 gypsum was shipped through twenty-five Nova Scotia ports; in 1908 only six ports were engaged in this trade. In Nova Scotia the deposits now being worked, in Hants and Victoria counties, yielded 74 per cent of the total Canadian production in 1927. The major portion of the gypsum quarried, is shipped as crude material to the United States where it is in demand, as products from Nova Scotia gypsum are considered superior to those produced from the general run of United States rock. Advantageous locations, with nearby rail and seaboard facilities, assisted materially in the continued expansion of this industry in Nova Scotia.

NEW BRUNSWICK

The centre of activities in the gypsum industry in New Brunswick is near Hillsborough, Albert county. Operations have been carried on in this district since 1847. In 1854 there was a change in the ownership of the quarries, and shortly after this date a plaster mill was erected to supply both local and United States consumers. In 1927 extensive operations were continued in this district by one company, while a small production was reported by an individual operator. Very pure quality gypsum is produced from the Hillsborough deposits; products made from this material consist of hard wall plaster, finishing plaster and dental plaster of different grades. In addition to shipments to Canadian markets, considerable quantities are exported to the United States, Australia, and New Zealand.

ONTARIO

The first record of gypsum in Ontario shows that in 1822 minor operations, consisting of the extraction of a few tons of this commodity for use as fertilizer, were conducted on a bed of gypsum near Paris, Ontario. The first mill for manufacturing gypsum was erected in 1823. Since that date operations in this district have been carried on almost continuously. At the present time the Canada Gypsum and Alabastine Ltd. (formerly Ontario Gypsum Company) operating at Lythmore and Caledonia, is the only producer.

MANITOBA

Developments in the gypsum industry in Manitoba are of comparatively recent date, the year 1901 marking the first active intensive work on deposits in the province. The *Manitoba Union Mining Company* in that year erected a crushing and calcining mill at the head of Portage Bay on lake Manitoba. In 1925 the production of gypsum from the deposit at Gypsumville, Manitoba, increased approximately 20 per cent over the preceding year. The 1927 output was 13 per cent higher than the total for 1926.

BRITISH COLUMBIA

The development of the gypsum industry in British Columbia only dates back to 1911, when a shipment of 780 tons was made to Vancouver and Victoria for use in the manufacture of cement. Small quantities were produced in this province during 1913 and 1917. From 1921 to 1925 minor tonnages were sold as land plaster for agricultural purposes. Operations on British Columbia deposits in 1926 became very extensive and comparatively large shipments were made to cement plants in Vancouver, B.C., and Exshaw, Alberta. The *British Columbia Gypsum Company* commenced shipments in 1926 from their quarry at Falkland to their mill at Port Mann which is equipped to calcine and prepare all grades of gypsum plasters as well as to manufacture plaster board. Exports of products from this mill were made to New Zealand during the current year.

Table 350.—Annual Production of Gypsum

Year	Nova Scotia		New Brunswick	
	Tons	Value	Tons	Value
		\$		\$
1874*	67,830	68,164		
1875	86,065	86,193	5,420	5,420
1876	87,720	87,590	4,925	6,616
1877	106,950	93,867	5,030	5,030
1878	88,631	76,695	16,335	16,435
1879	95,623	71,353	8,791	8,791
1880	125,685	111,833	10,375	10,987
1881	110,303	100,284	10,310	15,025
1882	133,426	121,070	15,597	24,581
1883	145,448	132,834	20,242	35,557
1884	107,653	100,446	21,800	32,751
1885*	81,887	77,898	15,140	27,730
1886	123,753	118,110	32,421	48,632
1887	116,346	116,346	29,102	29,216
1888	124,818	120,429	44,369	48,764
1889	165,025	142,850	40,866	49,130
1890	181,285	154,972	39,024	30,986
1891	161,934	153,955	36,011	33,996
1892	197,019	170,021	39,709	65,707
1893	152,754	144,111	36,916	41,846
1894	108,500	147,644	52,962	48,200
1895	156,809	133,929	66,949	63,839
1896	136,590	111,251	67,137	59,024
1897	155,572	121,754	82,658	118,116
1898	132,085	106,610	86,083	121,704
1899	126,754	102,055	116,792	151,296
1900	138,712	108,828	112,294	145,850
1901	170,100	136,947	121,595	189,709
1902	206,067	181,425	124,041	170,153
1903	189,427	173,881	119,182	172,080
1904	218,580	153,600	120,991	187,524
1905	272,252	208,248	163,553	232,586
1906	333,312	345,414	131,246	250,980
1907	357,411	380,859	118,106	213,638
1908	234,455	230,433	81,620	191,312
1909	345,682	364,379	98,716	226,975
1910	400,455	458,638	90,236	213,579
1911	353,999	406,457	93,205	115,044
1912	376,082	481,493	82,757	185,821
1913	404,801	479,515	103,954	279,395
1914	303,155	368,931	79,083	200,680
1915	298,864	339,857	74,501	184,929
1916	238,212	278,160	39,546	153,064
1917	215,472	301,261	38,556	191,631
1918	49,365	115,976	27,225	214,114
1919	163,852	250,174	42,409	315,656
1920	260,661	573,752	49,405	428,183
1921	206,831	511,883	54,030	360,220
1922	332,404	580,148	82,462	517,668
1923	341,705	747,934	104,740	564,680
1924	441,752	915,845	86,738	476,804
1925	551,230	1,070,408	71,745	408,917
1926	678,107	1,187,918	59,546	468,411
1927	829,438	1,512,015	85,293	524,550
Total	12,248,669	15,926,643	3,361,739	8,882,512

*1874 to 1885 inclusive, exports.

MINERAL PRODUCTION OF CANADA

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in Canada, by Provinces, 1874-1927

Ontario		Manitoba		British Columbia		Canada	
Tons	Value	Tons	Value	Tons	Value	Tons	Value
	\$		\$		\$		\$
						67,830	68,164
						91,485	91,613
						92,765	94,386
						111,980	98,897
						105,455	93,805
						104,993	80,864
						136,935	124,060
						121,270	116,349
						150,272	147,597
						166,152	169,228
						130,141	134,451
						97,552	106,415
						162,000	178,742
						154,008	157,277
						175,887	179,393
						213,273	205,108
						226,509	194,033
						203,605	206,251
						241,048	241,127
						192,568	196,150
						223,631	202,031
						226,178	202,608
						207,032	178,061
						239,691	244,531
						219,256	232,515
						244,566	257,329
						252,101	259,009
						293,799	340,148
						333,599	379,479
						314,489	358,459
						345,961	373,474
						442,153	586,168
						469,022	643,294
						485,921	646,914
						340,964	575,701
						473,129	809,632
						525,246	934,446
						518,383	993,394
						578,458	1,324,620
						636,370	1,447,739
						516,880	1,156,207
						474,815	854,929
						342,915	738,593
						336,332	881,984
						152,287	822,006
						299,063	1,215,287
						429,144	1,892,991
						386,550	1,785,538
						559,265	2,160,898
						578,301	2,243,100
						646,016	2,208,108
						740,323	2,389,891
						883,728	2,770,813
						1,063,117	3,251,015
1,328,634	5,955,379	738,244	7,146,145	47,132	365,143	17,724,418	38,276,822

Table 351.—Summary of Statistics on Gypsum in Canada, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Crude gypsum mined.....	705,852		931,193		1,105,704	
Crude gypsum calcined.....	162,820		161,841		193,232	
PRODUCTION BY GRADES—						
Lump.....	131,612	198,806	151,906	225,749	225,264	371,488
Crushed.....	447,766	820,141	576,489	1,002,679	665,499	1,223,070
Fine ground.....	5,993	35,843	5,874	36,813	7,035	42,633
Calcined.....	154,952	1,335,101	149,459	1,505,572	165,289	1,613,824
Total.....	740,323	2,389,891	883,728	2,770,813	1,063,117	3,251,015
PRODUCTION BY PROVINCES—						
Nova Scotia.....	551,230	1,070,408	678,107	1,187,918	829,438	1,512,015
New Brunswick.....	71,745	408,917	59,546	468,411	85,293	524,550
Ontario.....	82,020	491,833	89,987	496,059	83,998	500,688
Manitoba.....	35,088	417,868	35,172	461,461	39,895	512,008
British Columbia.....	240	865	20,916	166,964	24,493	201,754
Total.....	740,323	2,389,891	883,728	2,770,813	1,063,117	3,251,015
IMPORTS—						
Crude.....	4,433	66,064	933	32,442	1,092	42,741
Ground.....	119	3,858	209	6,846	111	2,996
Plaster of Paris.....	4,369	66,386	5,156	79,853	7,016	101,823
Total.....	8,921	136,308	6,298	119,141	8,219	147,560
EXPORTS—						
Crude.....	533,646	861,468	668,064	1,069,123	588,803	959,858
Ground.....	5,643	87,242	10,062	137,785	6,556	113,049
Total.....	539,289	948,710	678,126	1,206,908	595,364	1,072,907

Table 352.—Principal Statistics of the Gypsum Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	15	16	4,249,628	1,225	1,017,556	190,906	552,990	2,243,100
1924.....	14	15	4,423,697	1,219	1,114,468	181,003	458,268	2,208,108
1925.....	15	16	4,506,995	1,039	1,018,585	189,649	(a)	2,389,891
1926.....	18	19	6,696,077	1,368	1,255,427	241,414	(a)	2,770,813
1927.....	19	23	9,055,624	1,427	1,311,688	198,199	(a)	3,251,015

(a) Data not available.

Table 353.—Capital Employed in the Gypsum Industry in Canada by Provinces, 1926 and 1927

	1926			1927		
	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	2,255,254	3,428,095	5,683,349	3,747,108	3,787,921	7,535,029
Cost of all supplies and stocks on hand.....	219,539	216,125	435,664	362,006	175,059	537,065
Cash, trading and operating accounts and bills receivable.....	48,448	528,616	577,064	237,210	746,320	983,530
Total.....	2,523,241	4,172,836	6,696,077	4,346,324	4,709,300	9,055,624

Table 354.—Employees, Salaries and Wages in the Gypsum Industry in Canada, 1926 and 1927

	1926				1927			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
Salaried employees.....	58	10	68	\$ 159,835	53	10	63	\$ 178,976
Wage-earners—								
Mine.....	891		891		973		973	
Mill.....	409		409		391		391	
Total.....	1,300		1,300	1,095,592	1,364		1,364	1,132,712
Grand total.....	1,358	10	1,368	1,255,427	1,417	10	1,427	1,311,698

Table 355.—Wage-Earners in the Gypsum Industry in Canada by Provinces, 1927

Month	Nova Scotia		New Brunswick		Ontario		Manitoba		British Columbia		Canada	
	Mine	Mill	Mine	Mill	Mine	Mill	Mine	Mill	Mine	Mill	Mine	Mill
January.....	432	105	70	91	52	40	19	54	18	43	591	333
February.....	357	99	66	99	54	32	23	61	22	44	522	335
March.....	338	112	50	108	50	39	15	51	26	47	479	357
April.....	723	127	65	100	56	39	16	52	29	51	889	369
May.....	1,047	218	75	129	55	43	17	48	30	47	1,224	485
June.....	1,107	140	84	117	61	55	16	46	32	48	1,300	406
July.....	1,027	128	80	106	45	53	17	49	34	59	1,203	395
August.....	939	109	76	86	47	52	16	47	36	62	1,114	356
September.....	864	118	49	73	45	58	16	52	39	61	1,013	362
October.....	699	108	77	90	44	66	41	57	36	63	897	354
November.....	535	73	63	86	58	59	18	54	37	47	711	319
December.....	417	77	52	85	6	47	15	67	21	47	571	323

Table 356.—Fuel and Electricity Used in the Gypsum Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Canadian.....	Ton	20,620	139,432	7,533	46,748
Bituminous coal—Imported.....	Ton	483	4,932	4,925	38,700
Coke.....	Imp. gal.	115,603	28,660	629	5,565
Gasoline.....	Imp. gal.			114,833	28,203
Kerosene or coal oil.....	Imp. gal.			1,914	531
Fuel and diesel oil.....	Imp. gal.	39,150	7,026	132,039	12,525
Wood.....	Cord			2,025	3,760
Gas—natural.....	M cu. ft.	5,080	2,676	4,036	1,907
Electricity purchased*.....	K.W.H.	4,476,045	58,688	4,074,291	60,260
Electricity generated*.....	K.W.H.			86,314	
Total.....			241,414		198,199

* In 1926 the record shows only total electricity used.

Table 357.—Power Employed in the Gypsum Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	13	1,700	11	1,480
Gasoline, gas and oil engines.....	40	1,616	38	1,909
<i>Total primary power.....</i>	<i>53</i>	<i>3,316</i>	<i>49</i>	<i>3,389</i>
Electric motors run by purchased power.....	95	3,601	111	4,343
Total power employed.....	148	6,917	160	7,732
Electric motors run by primary power in same plant.....	51	831	34	569
<i>Total electric power.....</i>	<i>146</i>	<i>4,432</i>	<i>145</i>	<i>4,912</i>
Boilers.....	21	2,060	18	1,630

Table 358.—*World Production of Gypsum 1913, and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
United Kingdom.....	285,338	317,909	371,703	414,529	465,191	506,350
Canada.....	568,188	516,340	576,800	661,003	789,043	949,211
Union of South Africa.....	108	5,731	9,073	7,123	11,029	15,187
Cyprus (Exports).....	3,714	11,029	14,296	24,193	20,410	15,150
India.....	24,961	39,297	38,123	36,244	34,473	38,105
Australia.....	8,826	68,236	85,861	90,150	80,565	122,842
Total.....	891,135	958,542	1,095,856	1,233,242	1,400,711	1,646,845
FOREIGN COUNTRIES						
Austria.....		35,561	32,262	24,067	21,739	24,814
Estonia.....	(a)	(a)		3,821	4,751	11,979
France.....	1,698,633	2,319,414	2,289,443	2,293,000	(a)	(a)
Germany.....		29,579	42,635	57,352	44,956	(a)
Greece.....	2,194	2,434	21,850	9,898	9,158	(a)
Italy.....		547,364	590,298	662,707	645,012	(a)
Jugoslavia.....					610	1,046
Luxemburg.....				24,553	33,447	7,724
Rumania.....			20,454	52,994	43,616	76,496
Russia.....		37,810		166,353	286,993	278,532
Spain (exports).....	(a)	(a)	(a)	2,958	3,165	(a)
Algeria.....	6,938	2,444	4,568	71,700	64,600	(a)
United States.....	2,320,989	4,244,150	4,502,347	5,066,964	5,031,644	4,774,007
Argentina (exports).....	171	2,106	2,179	1,833	(a)	(a)
Chile.....	6,038	8,147	5,600	8,310	16,065	(a)
Peru.....	(a)	(a)	(a)	14,413		
China (exports).....	4,970	7,159	5,042	6,984	3,721	2,431
Japan.....	(a)	33,724	42,400	152,736	(a)	(a)
Total.....	4,039,933	7,318,525	7,612,678	8,620,646	6,209,477	5,177,029
Grand total.....	4,931,068	8,277,067	8,708,534	9,853,888	7,610,188	6,823,874

*Source.—Prior to 1925 Imperial Institute publications: Data for 1925 and 1926 obtained directly from the statistical bureaus of the different countries.

(a) Data not available.

IRON OXIDES

CANADA

Mineral pigments produced in Canada in 1886 and classified under the above heading amounted to 350 tons valued at \$2,350. The annual variation in production has been considerable since that date; the low point for the industry being reached in 1890 when 275 tons were extracted, while the maximum output, 19,128 tons, was reached in 1920.

In the production totals for 1917, 1919 and 1920, a small quantity of zinc oxide has been included. This material was produced at the oxide plant at Notre Dame des Anges, Quebec, for use as a pigment.

Iron oxides produced in Canada have two main uses: (a) for the purification of illuminating gas and (b) as a raw material in the paint industry. When the material is to be used in the purification of coal gas, the iron oxides are shipped as mined but when it is to be used in the manufacture of paints, it is customary to dry and calcine the oxides before they are shipped.

Shipments of iron oxides during 1927 totalled 6,125 tons valued at \$103,536 and the capital employed in this industry in Canada was reported at \$153,317. Salaries and wages paid to the 48 employees totalled \$38,680. Expenditures for fuel and electricity used during the year reached the total of \$18,222.

QUEBEC

In 1851, an important deposit of ochre was worked at Pointe du Lac, St. Maurice county, and shipments of dried ochre were made to the United States but subsequently this property was abandoned. Thirty-two years later the manufacture of dry ochre was commenced on a small scale in Iberville township on the Little Romaine river. This deposit was later abandoned but in 1916 it was re-opened and a small quantity of crude ochre was taken out for use as a pigment in the paper industry. A deposit was opened up at St. Malo, Champlain county, in 1885 and a calcining plant erected. Calcined ochre was shipped from this mill to Montreal where it was further prepared for use in the manufacture of paint.

Interesting information concerning the deposits in the Three Rivers district is contained in the report by H. Frechette published in the *Summary Report of the Mines Branch* for 1919 and 1920. An extract from this report follows:—

The more important occurrences of ochre lie to the North of the St. Lawrence river. One group of such deposits is situated a short distance to the east of Three Rivers, between Cap de la Magdeleine and Champlain, about two miles north from the St. Lawrence. In this area, at Red Mill, the Canada Paint Company, Ltd., operates an extensive plant for calcining, washing, and grinding pigments from its deposits. A variety of shades of red, umber, and sienna are produced.

The plant and deposits of the Champlain Oxide Company are about 1½ mile east of Red Mill. This company operates a calcining plant, which is situated near the deposits, and a grinding and packing plant beside the Canadian Pacific Railway tracks.

For a number of years Thomas H. Argall, of Three Rivers, produced calcined red oxide from his deposits two miles east of those of the Champlain Oxide Company. Owing to labour troubles, he closed his plant and transferred his business to Pointe-au-Lac where he now ships uncalcined ochre for use in the purifying of illuminating gas. He obtains this material from a series of deposits lying about one mile to the north of his warehouse, which is beside the Canadian Pacific Railway tracks, nine miles west of Three Rivers.

About thirty years ago the Radnor Paint Company operated a calcining and grinding plant at Proulx, Champlain county. The crude ochre was obtained from rather irregular deposits along the beds of the small brooks which join and flow into the St. Maurice river a short distance south of Grandes Piles. This property is now owned by the Laurentide Company, of Grand Mere, and is within the area set aside by them for reforestation.

To the south of the St. Lawrence river, in the sixth range of Gentilly, there is a rather extensive deposit of ochre between the base of a high sand hill and the Gentilly river. In places the ochre is rather sandy. Several years ago this deposit was worked to a limited extent by Ouellet and Thibaudeau. Two small calcining furnaces are all that now remain of the equipment. The deposits are situated six or seven miles from the railway and hauling had to be done over poor roads.

ONTARIO

Prior to 1911 small quantities of ochre were produced intermittently from a deposit at Campbellville, Halton county. No production has been recorded in this province since that date.

BRITISH COLUMBIA

In 1921 a trial shipment of bog iron ore was made from Alta lake. The following year an experimental consignment was sent to Calgary by a small operator in the Windermere district. Shipments totalling 500 tons were made from these two deposits during 1923. There has been a small annual production during the past four years.

Table 359.—Production of Iron Oxides in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	350	2,350	1901.....	2,233	16,735	1916.....	8,811	58,711
1887.....	485	3,733	1902.....	4,955	30,495	1917.....	9,409	87,605
1888.....	397	7,900	1903.....	6,266	32,760	1918.....	17,317	112,440
1889.....	794	15,280	1904.....	3,925	24,995	1919.....	11,862	113,421
1890.....	275	5,125	1905.....	5,105	34,675	1920.....	19,128	157,909
1891.....	900	17,750	1906.....	6,758	36,125	1921.....	9,048	93,610
1892.....	390	5,800	1907.....	5,828	35,570	1922.....	7,285	110,608
1893.....	1,070	17,700	1908.....	4,746	30,440	1923.....	10,424	129,636
1894.....	611	8,690	1909.....	3,940	28,093	1924.....	7,266	91,160
1895.....	1,339	14,600	1910.....	4,813	35,185	1925.....	7,118	91,913
1896.....	2,362	16,045	1911.....	3,622	28,333	1926.....	6,626	101,843
1897.....	3,905	23,560	1912.....	7,654	32,410	1927.....	6,125	103,536
1898.....	2,226	17,450	1913.....	5,987	41,774			
1899.....	3,919	20,000	1914.....	5,890	51,725	Total.....	219,378	1,951,447
1900.....	1,966	15,398	1915.....	6,248	48,353			

Table 360.—Production in Canada, Imports and Exports of Iron Oxides, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	7,118	91,913	6,626	101,843	6,125	103,536
IMPORTS—						
Ochres, ochrey earths, siennas, and umbers.....	2,401	82,096	2,949	97,405	2,654	90,614
Oxides, fire proofs, rough stuffs, fillers and colours, dry, n.o.p.....	2,532	460,063	3,054	560,116	3,356	632,470
EXPORTS—						
Mineral pigments, iron oxides and ochres..	850	40,435	808	34,259	852	34,800

Table 361.—Principal Statistics of the Iron Oxides Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	6	6	209,340	60	49,056	17,677	55,318	129,636
1924.....	5	5	193,833	38	33,221	16,815	34,428	91,160
1925.....	5	5	173,940	47	35,454	16,073	(a)	91,913
1926.....	5	5	178,078	45	38,348	17,576	(a)	101,843
1927.....	5	5	153,317	48	38,680	18,222	(a)	103,536

(a) Data not available.

Table 362.—Capital Employed in the Iron Oxides Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	133,719	133,719
Cost of supplies and stocks on hand.....	33,495	18,948
Cash, trading and operating accounts and bills receivable.....	10,864	650
Total.....	178,078	153,317

Table 363.—Employees, Salaries and Wages in the Iron Oxides Industry in Canada, 1926 and 1927

Class	1926		1927	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	2	3,100	3	3,750
Wage-earners.....	43	35,248	45	34,930
Grand total.....	45	38,348	48	38,680

Table 364.—Wage-Earners in the Iron Oxides Industry in Canada, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	21	20	July.....	54	54
February.....	20	20	August.....	54	56
March.....	24	23	September.....	54	50
April.....	26	35	October.....	49	48
May.....	26	40	November.....	40	37
June.....	41	52	December.....	22	35

Table 365.—Fuel and Electricity Used in the Iron Oxides Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton			12	192
Bituminous coal—Canadian.....	Ton	903	7,130	950	7,140
Fuel oil and diesel oil.....	Imp. gal.	1,680	227	160	19
Gasoline.....	Imp. gal.	1,300	468	1,500	458
Wood.....	Cord	1,220	6,315	1,383	7,007
Electricity.....	K.W.H.	171,598	3,436	170,306	3,406
Total.....			17,576		18,222

Table 366.—Power Employed in the Iron Oxides Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Gasoline, gas and oil engines.....	4	80	2	60
<i>Total primary power.....</i>	<i>4</i>	<i>80</i>	<i>2</i>	<i>60</i>
Electric motors run by purchased power.....	4	117	4	117
Total power employed.....	8	197	6	177
Boilers.....			1	15

MICA

CANADA

The first official record of the production of mica in Canada was for the year 1886, when 20,361 pounds of cut mica valued at \$29,008 were shipped by three producers in Ontario and one in Quebec. During the following year 22,083 pounds of cut mica and 18 tons of ground mica were produced. In 1890, mica shipped, for electrical purposes totalled 400,559 pounds averaging 14.6 cents per pound; for the stove trade, 3,400 pounds at \$2.50 per pound; and waste mica, 367,000 pounds worth \$5.00 per ton.

In point of production value, 1920 was the peak year for the mica industry in Canada with total sales valued at \$376,022. Records of the tonnage produced only cover the period 1909 to 1926 and during that time the annual shipments varied from 369 tons to a maximum for the industry of 4,091 tons in 1924. During that year the 50 mica producers had a capital investment of \$249,876 and a payroll of 223 employees receiving \$127,201. In 1927 the capital employed by the 21 operating firms was reported at \$322,389. Salaried employees and wage-earners engaged in this industry totalled 168 and their combined earnings amounted to \$118,505. Fuel and electricity used during the year necessitated an expenditure of \$4,400. Production during the year totalled 2,738 tons valued at \$174,377, while Customs' records showed exports of rough cobbed and thumb-trimmed mica amounting to 165 tons appraised at \$54,937; splittings, 159 tons at \$213,651; and scrap and waste, 4,536 tons at \$57,499.

Important deposits of mica in Canada are located in the counties of Hull and Labelle in Quebec, and Lanark, Leeds and Frontenac in Ontario. The product of these mines, in the main part, is shipped first to mica-trimming shops, conveniently located, where it is either rough-cobbed or split and trimmed prior to exportation to the United States or Great Britain.

Large quantities of scrap mica were shipped to the United States to be ground for use in the manufacture of prepared roofings. According to a survey made in 1923, the consumption of mica by Canadian industries in that year, was as follows: roofing materials, 359 tons; wallpaper, 200 tons; electrical goods, 31 tons; and rubber, 22 tons.

Statistics relating to the extensive mica-trimming shops in Ontario and Quebec have not been included in this report, but have been treated under a separate heading in the report on *Manufactures of Non-Metallic Minerals*.

India, United States, Canada, South Africa and Madagascar are the principal mica-producing countries. Only muscovite is produced in each of the first two countries; the Canadian output consists of phlogopite, while the Madagascar production is made up of one-fifth muscovite and the balance phlogopite. It will be seen that the last named country is Canada's chief competitor. Phlogopite or amber mica is used in the construction of electrical equipment in preference to muscovite.

Scrap material, which includes mica that is too small and irregular for splitting, and the refuse from the trimming shops, is ground and bolted into various sizes, grading from 20-mesh to 200-mesh. Grades ranging from 20 to 80 mesh are used in the manufacture of prepared roofings; the 40-mesh grade, if free from grit, is used as a lubricant in some axle greases; and the 200-mesh grade is used as a filler in rubber manufacture.

It will be noted that the stated value of the exports of Canadian mica exceeded by a considerable amount the value placed on shipments reported by operators. An explanation of this, lies in the fact, that the exported material consisted principally of mica splittings shipped from large trimming shops situated in Ontario and Quebec.

Under the United States New Tariff Act the duties on the different grades of mica are as follows: mica, unmanufactured, valued at not above 15 cents per pound—4 cents per pound; mica, unmanufactured, valued at above 15 cents per pound—25 per centum ad valorem; mica,

cut or trimmed and mica splittings—30 per centum ad valorem; mica plates, and built-up mica, and all manufactures of mica, of which mica is the component material of chief value—40 per centum ad valorem; ground mica—20 per centum ad valorem.

QUEBEC

The Villeneuve mine in Ottawa county was first worked in 1884 and was operated continuously until 1888 during which period approximately 35,000 pounds of muscovite mica were shipped. Intermittent operations were carried on at this property from 1890 to 1898.

In 1898 about eight important amber mica mines were in operation in Quebec, and in addition small shipments were made from some 20 prospects. The following year the amber mica industry was in a flourishing condition, 35 operators reported production while 20 prospects were in the process of development. Shipments of thumb-trimmed mica during that year, according to provincial records, were 331 tons; additional shipments were made of mica (not prepared) totalling 240 tons. In 1907, considerable activity was recorded in the industry and 288 wage-earners earning \$108,600 were employed. During the ensuing year a decline in employment was noted as only 184 workers receiving \$47,724 were engaged. The 1909 records show shipments totalling 128 tons; employment furnished 176 men; and wages amounting to \$35,884. Fourteen operators in 1921 employed 75 workers who received \$48,134 and produced 484 tons. Data for 1927 show 12 producers shipping 1,454 tons and a pay roll of 111 workers receiving \$73,042.

ONTARIO

A muscovite deposit in North Burgess township opened up in 1869 was one of the first mica mines operated in Canada. About 2 tons of mica were produced and shipped from this deposit for use in the stove industry in the United States.

Ontario deposits of mica are located principally in an area of 900 square miles between Kingston and Ottawa. Prior to 1890, the mining of mica was generally carried on in conjunction with the production of phosphate. During that year the demand for mica increased, with a consequent advance in production. Ontario deposits shipped 240 tons in 1890. Shipments increased to a total of 291 tons in 1906 in the production of which there were 147 employees earning \$48,221. The following year, 456 tons were sold and employment was furnished 158 wage-earners who received \$63,450. Ontario's six operators in 1921, had 29 employees on their payrolls whose earnings totalled \$26,298. During 1927, operators numbered 8; employees 47; salaries and wages, \$34,824; and production 1,284 tons valued at \$75,183.

In Ontario trimming shops and splitting works are located at Ottawa, Kingston and Perth. Scrap mica is sold in large quantities and it is concentrated, ground to various sizes and shipped for use in surfacing tar or asphalt roofing shingles and ready roofing, in the manufacture of lubricants and in the rubber industry. Ontario's first mica-grinding plant was built at Bancroft in 1926.

Table 367.—Production of Mica in Canada, by Provinces, 1886-1927

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1886		6,991		22,017		29,008
1887		8,276		21,540		29,816
1888	No record		15	30,207	15	30,207
1889		1,496		27,222		28,718
1890		9,590		58,484		68,074
1891		27,000		44,510		71,510
1892		23,000		81,749		104,745
1893*						75,719
1894*						45,581
1895*						65,000
1896*						68,909
1897		26,000		50,000		76,000
1898		106,375		12,000		118,375
1899		133,000		29,475		163,000
1900		106,000		60,000		166,000
1901		120,000		40,000		160,000
1902	66	34,304	993	101,600	1,059	135,904
1903		74,119		103,738		177,857
1904		76,487		84,290		160,777
1905		109,672		68,563		178,235
1906	283	159,334	291	144,579	574	303,913
1907	318	224,197	456	88,402	774	312,599
1908	148	82,613	288	57,258	436	139,871
1909	128	93,298	241	54,484	369	147,782
1910	316	87,295	442	103,090	758	190,385
1911	217	69,465	373	59,212	590	128,677
1912	196	81,044	384	62,932	580	143,976
1913	626	125,488	478	68,816	1,104	194,304
1914	246	62,794	349	46,267	595	109,061
1915	217	50,390	200	41,515	417	91,905
1916	844	192,343	364	62,896	1,208	255,239
1917	774	286,730	392	72,121	1,166	358,851
1918	481	229,119	266	42,431	747	271,550
1919	2,429	218,437	325	55,351	2,754	273,788
1920	737	281,460	1,466	94,562	2,203	376,022
1921	484	41,172	218	28,891	702	70,063
1922	1,360	97,748	1,989	54,515	3,349	152,263
1923	1,545	216,684	1,980	110,290	3,525	326,974
1924	1,677	185,020	2,414	172,252	4,091	357,272
1925	2,415	178,800	1,605	82,663	4,020	261,463
1926	1,664	170,118	881	59,086	2,545	229,204
1927	1,454	99,194	1,284	75,183	2,738	173,377
Total						6,814,065

*Exports plus consumption—accurate separation of data by provinces not obtainable.

†Includes production from British Columbia valued at \$525.

Table 368.—Production of Mica in Canada by Grades, 1926 and 1927

	1926			1927		
	Pounds	Value f. o. b. shipping point	Price per pound	Pounds	Value f. o. b. shipping point	Price per pound
		\$	\$		\$	\$
Rough cobbled	109,880	11,724	0.10	255,925	16,943	0.08
Thumb-trimmed	322,639	64,958	0.20	443,090	72,513	0.16
Splittings only	180,603	120,603	0.67	81,919	54,048	0.66
Scrap	4,476,405	32,019	0.007	4,696,058	30,873	0.007
Total	5,089,527	229,204	0.04	5,476,992	174,377	0.03

Table 369.—Production in Canada, Imports and Exports of Mica, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	2,415	178,800	1,664	170,118	1,454	99,194
Ontario.....	1,605	82,663	881	59,086	1,284	75,183
Total.....	4,020	261,463	2,545	229,204	2,738	174,377
IMPORTS—						
Mica and manufactures of, n.o.p.....		115,994		137,347		97,000
EXPORTS—						
Rough cobbled and thumb-trimmed.....	28	21,366	44	20,516	165	54,937
Splittings.....	230	324,967	315	432,345	159	213,651
Scrap and waste.....	4,991	63,931	3,799	45,297	4,536	57,499
Plate and manufactures (micanite).....		1,046		1,084		759
Total.....		411,310		499,242		326,846

Table 370.—Principal Statistics of the Mica Mining Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	33	33	223,650	219	112,469	4,772	60,216	326,974
1924.....	50	50	249,876	223	127,201	5,532	(a)	357,272
1925.....	36	36	190,144	269	123,079	4,528	(a)	261,463
1926.....	22	22	186,478	208	128,269	5,353	(a)	229,204
1927.....	21	21	322,389	168	118,505	4,400	(a)	174,377

(a) Data not available.

Table 371.—Capital Employed in the Mica Mining Industry in Canada, by Provinces, 1926 and 1927

	1926			1927		
	Quebec	Ontario	Canada	Quebec	Ontario	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	122,771	20,192	142,963	103,698	22,842	126,540
Cost of supplies and stocks on hand.....	18,362	2,360	20,722	56,952	4,160	61,112
Cash, trading and operating accounts and bills receivable.....	19,293	3,500	22,793	47,624	17,296	64,920
Total.....	160,426	26,052	186,478	208,274	44,298	*322,389

*Includes capital for 1 firm in British Columbia.

Table 372.—Wage-Earners in the Mica Mining Industry in Canada, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	138	127	July.....	179	138
February.....	156	141	August.....	179	141
March.....	152	152	September.....	191	146
April.....	157	157	October.....	144	105
May.....	204	148	November.....	107	113
June.....	218	142	December.....	91	107

Table 373.—Employees, Salaries and Wages in the Mica Mining Industry in Canada, 1926 and 1927

	1926		1927	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	12	17,668	9	14,622
Wage-earners.....	196	110,601	159	103,883
Total.....	208	128,269	168	118,505

Table 374.—Fuel and Electricity Used in the Mica Mining Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal--Imported.....	Ton	103	809	110	700
Gasoline.....	Imp. gal.	1,300	403	865	181
Kerosene or coal oil.....	Imp. gal.			46	10
Wood.....	Cord	498	3,101	461	2,888
Electricity.....	K.W.H.	34,500	1,040	18,000	621
Total.....			5,353		4,400

Table 375.—Power Employed in the Mica Mining Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....			2	125
Hydraulic turbines or water wheels.....	1	150	1	145
Total primary power.....	1	150	3	270
Electric motors run by purchased power.....	3	48	2	75
Total power employed.....	4	198	5	345
Electric motors run by primary power in same plant.....	4	125	—	—
Total electric motors.....	7	173	2	75
Boilers.....	4	300	3	100

Table 376.—*World Production of Mica, 1913 and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE—						
Canada.....	986	3,147	3,653	3,589	2,272	2,445
India.....	2,288	3,948	4,112	4,985	4,497	3,874
Southern Rhodesia.....		81	134	130	163	183
Tanganyika Territory.....		32	55	68	52	42
Union of South Africa.....		13	892	1,054	1,130	1,660
Ceylon.....		1		1	(a)	
Australia.....			2	4	7	9
Total.....	3,274	7,222	8,848	9,831	8,121	8,213
FOREIGN COUNTRIES—						
United States.....	5,511	8,112	4,856	9,457	7,257	6,283
Madagascar.....		162	274	282	325	338
Argentina (exports).....	6	100	118	117	83	75
Brazil.....	10	55	78	64	51	39
Japan.....		424	582	1,065	(a)	(a)
Germany.....				493	654	(a)
Guatemala.....				16	12	(a)
Chosen (Korea).....		11	23	20	16	(a)
Norway.....		10	25	23	41	6
Russia.....		(a)	(a)	190	477	1,496
Spain.....						(a)
Sweden.....		5	4	93	52	10
Total.....	5,527	8,882	5,960	11,630	8,968	8,247
Grand total.....	8,801	16,104	14,808	21,461	17,089	16,460

*Source—Imperial Institute publications.

(a) Data not available.

(b) Estimated.

QUARTZ

CANADA

Quartz production in Canada prior to 1906 was not remunerative enough to cause much activity in this industry. The earliest records available show that in 1890 a shipment of 200 tons valued at \$1,000 was made from a Quebec deposit. Small shipments were recorded in 1893, 1896, 1898 and 1899. During 1906 production commenced for the purpose of supplying flux and furnace linings to the industries in the Sudbury district of Ontario. Shipments from the Ontario quarries have been continuous since that date.

The high mark for the industry of 268,155 tons was reached in 1918. The production during 1927 reached the total of 233,984 tons valued at \$496,364. An increase of 0.8 per cent in quantity and a decrease of 10.3 per cent in value is indicated by these figures when compared with the totals for the preceding year of 232,082 tons worth \$553,161.

Imports of silex or crystallized quartz into Canada during 1927 totalled 3,188 tons with a valuation of \$75,230. Flint importations decreased slightly from the 1926 total and amounted to 4,311 tons appraised at \$46,551.

Capital employed by the 19 firms operating in the Canadian quartz industry was \$963,216. Employment was furnished 17 salaried employees and 250 wage-earners; their total earnings amounted to \$271,555. The cost of fuel and electricity used in this industry was \$34,423. Primary power employed consisted of 16 units with a combined rating of 713 h.p. Electric motors in operation during the year were reported at 32 units with a total rating of 1,048 h.p.

QUEBEC

The first recorded production of quartz in Quebec was in 1890. Output figures for that year show shipments of 200 tons valued at \$1,000. In 1893, a small shipment of 100 tons was made from a deposit on the north shore of the St. Lawrence river near Quebec. From 1910 to 1916, production ranged between 548 tons and 1,149 tons, however, increases were shown during the ensuing years and the maximum total of 49,141 tons for the province was reached in 1927.

During 1923, four quarries were in operation in Quebec; their capital investment totalled \$173,858, while 47 men were employed earning \$48,260. The seven quarries active in 1927 reported actual capital employed at \$271,472; and a pay-roll of 85 men receiving \$85,028.

A deposit of Potsdam sandstone, one mile east of St. Canute, supplies a considerable portion of the production of silica in Quebec. This sandstone is ground and screened, four grades in all being produced, the first three of which are consumed in the glass, silicon carbide and foundry industries.

A considerable tonnage of quartz is produced annually in connection with feldspar quarrying in the Buckingham district.

ONTARIO

The first production of importance in the quartz industry in Ontario is recorded for 1906, when 48,376 tons were shipped. This material was extracted from quarries in the Sudbury district and was used mainly as a flux and for furnace linings. In 1909, a small quantity of quartz was shipped by feldspar producers. The following year shipments commenced to Welland for the manufacture of ferrosilicon; 92 men were employed in the quarries with wages amounting to \$49,382. Maximum production for the industry was attained in 1923 when 225,110 tons valued at \$483,285 were shipped and employment was furnished 218 men earning \$213,780. Capital actually invested in the 7 quarries operating that year was \$820,206. During 1927, the 8 plants in operation produced 159,150 tons worth \$266,204; had a capital investment of \$470,495; and employed 110 men who received \$99,889.

BRITISH COLUMBIA

Quartz production commenced in British Columbia during 1914 with a total of 30,559 tons produced at Anyox and Trail. This material is quarried for use as a flux at the Anyox and Trail smelters. The 1918 shipments totalled 49,886 tons; the high mark for the industry in the province. In 1927, the production was 20,859 tons valued at \$80,824.

Table 377.—Production of Quartz in Canada, 1890-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1890.....	200	1,000	1908.....	44,741	52,830	1919.....	94,991	527,635
1891-1892.....			1909.....	56,924	71,285	1920.....	128,295	467,821
1893.....	100	500	1910.....	88,205	91,951	1921.....	100,350	312,947
1894-1895.....			1911.....	60,526	83,865	1922.....	109,947	208,598
1896.....	10	50	1912.....	100,242	185,216	1923.....	264,076	599,250
1897.....			1913.....	78,761	169,842	1924.....	150,896	323,156
1898.....	284	570	1914.....	54,148	84,583	1925.....	197,224	363,612
1899.....	600	1,260	1915.....	127,108	205,153	1926.....	232,082	553,161
1900-1905.....			1916.....	136,745	251,226	1927.....	233,984	496,364
1906.....	48,376	65,765	1917.....	216,288	496,182	Total.....	2,849,343	6,377,783
1907.....	56,585	124,148	1918.....	268,155	629,813			

Table 378.—Production in Canada, and Imports of Quartz, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Nova Scotia.....	1,352	6,760	8,333	29,018	4,834	16,721
Quebec.....	6,459	30,064	24,550	107,779	49,141	132,615
Ontario.....	188,560	324,526	192,733	339,304	159,150	266,204
British Columbia.....	853	2,262	6,466	77,060	20,859	80,824
Total.....	197,224	363,612	232,082	553,161	233,984	496,364
IMPORTS—						
Silica.....	2,196	39,301	2,554	60,070	3,188	75,230
Flint.....	3,601	36,936	4,731	49,635	4,311	46,551

Table 379.—Principal Statistics of the Quartz Mining Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	11	12	1,044,456	278	284,189	55,985	161,881	599,250
1924.....	11	11	991,863	171	172,397	34,281	44,848	323,156
1925.....	14	15	1,005,159	153	145,494	20,495	(a)	363,612
1926.....	17	18	1,056,705	243	208,839	44,311	(a)	553,161
1927.....	19	20	963,216	267	271,555	34,423	(a)	496,364

(a) Data not available.

Table 380.—Capital Employed in the Quartz Mining Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	946,839	823,789
Cost of supplies and stocks on hand.....	101,860	103,430
Cash, trading and operating accounts and bills receivable.....	8,006	35,997
Total.....	1,056,705	963,216

Table 381.—Employees, Salaries and Wages in the Quartz Mining Industry in Canada, 1926 and 1927

	1926				1927			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	16	1	17	28,351	16	1	17	21,940
Wage-earners.....	226		226	180,488	250		250	249,615
Total.....	242	1	243	208,839	266	1	267	271,553

Table 382.—Wage-Earners in the Quartz Mining Industry in Canada, by Months, 1926 and 1927

Month	1926	1927	Month	1926	1927
January.....	73	173	July.....	193	245
February.....	70	173	August.....	216	214
March.....	77	219	September.....	219	183
April.....	66	227	October.....	248	170
May.....	109	227	November.....	256	164
June.....	169	233	December.....	145	150

Table 383.—Fuel and Electricity Used in the Quartz Mining Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Canadian.....	Ton	{	3,468	146	1,309
Bituminous coal—Imported.....	Ton			2,848	18,396
Coke.....	Ton			30	275
Fuel oil and diesel oil.....	Imp. gal.	69,132	7,977	78,478	6,177
Gasoline.....	Imp. gal.	1,320	408	4,316	1,222
Kerosene or coal oil.....	Imp. gal.			706	195
Wood.....	Cord	30	175		
Electricity.....	K. W. H.	653,000	13,333	399,420	6,849
Total.....			44,311		34,423

Table 384.—Power Employed in the Quartz Mining Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	11	607	10	407
Gasoline, gas and oil engines.....	4	114	6	306
<i>Total primary power.....</i>	<i>15</i>	<i>721</i>	<i>16</i>	<i>713</i>
Electric motors run by purchased power.....	7	213	17	575
Total power employed.....	22	934	33	1,288
Electric motors run by the primary power in same plant.....	7	320	15	473
<i>Total electric motors.....</i>	<i>14</i>	<i>533</i>	<i>32</i>	<i>1,048</i>
Boilers.....	5	775	6	585

SALT

CANADA

The production of salt in the province of Ontario was first recorded in 1866 when a company was formed to drill for oil on the north bank of the Maitland river, and, while no success attended the efforts of the drillers in their search for oil, a bed of rock salt was found at a depth of 964 feet. In September, 1866, this company (incorporated under the name of the *Goderich Petroleum Company*, later changed to *Goderich Salt Company*) commenced pumping brine. In the initial working in connection with these deposits the refining was done by the kettle method, which was soon discarded and replaced by the pan method of evaporation. Wells were drilled and plants erected at Clinton and Seaforth, Ontario, and four refineries were in operation at Goderich in 1879; at the present time there are only two firms operating at Goderich.

Census reports show that there were 16 salt works in operation in Ontario and 2 in Nova Scotia during 1871. The Ontario plants employed 175 men with a total wage of \$60,990 while the products made were valued at \$119,999. In Nova Scotia during that year there were 10 employees who received \$2,040 and the total value of the plant production was \$16,600. According to the 1881 census, 26 plants were in operation in Ontario and 1 each in Nova Scotia and New Brunswick. Total employees that year numbered 247 earning \$78,517; products made were valued at \$395,848 and the capital invested in the operating plants was \$298,100. The development of the industry has reached the point where in 1927 the 11 plants in operation reported a capital investment of \$3,194,802; the number of employees was 376 who received salaries and wages amounting to \$499,967; products sold during the year had a valuation of \$1,614,667.

Salt production in Canada continues to increase; the high record of 262,547 tons produced in 1926 was topped by a new high mark of 268,672 tons in 1927. This year's value was recorded at \$1,614,667, as compared with a value of \$1,480,149 for the 1926 production. The average price for all grades advanced somewhat, being \$6.01 per ton in the year under review, as against \$5.63 in the previous twelve months.

Ontario's production was 254,181 tons or 94.6 per cent of the Canadian total; Nova Scotia and Alberta contributed the remainder. Alberta shipments were from the Fort McMurray district and totalled 100 tons. The Nova Scotia production was obtained from the Malagash mine.

Imports of salt into Canada were recorded at 176,761 tons appraised at \$1,082,080. Exports of Canadian salt amounted to 1,212 tons valued at \$22,793.

Fuel costs reported by the 10 companies in operation in 1927 accounted for an outlay of \$271,765 while the electric power consumed added \$15,495 to the total operating expenditures. Bituminous coal was the largest item among the fuels consumed amounting to 51,167 tons at \$263,009. Steam engines employed numbered 22 with a rating of 567 h.p. The 72 electric motors in use during the year were rated at 966 h.p.

NOVA SCOTIA

At Malagash, Nova Scotia, in October, 1917, bore holes were drilled to depths ranging from 80 feet to 173 feet to prove up a deposit of rock salt. During the following two years shaft sinking and further development work were carried on. A small shipment was made from this deposit in 1919, and in 1920 sales totalled 3,023 tons. Production has increased in Nova Scotia and during 1927 shipments reached the high mark of 14,391 tons.

NEW BRUNSWICK

Small quantities of brine have been evaporated for local consumption at Plumweseep, near Sussex, King's county, New Brunswick. These operations ceased about 1898.

ONTARIO

Salt production in Ontario dates back to 1866, and this industry has since developed into one of the province's most stable industries, ranking second only to natural gas in point of annual production value in the non-metallic group. The salt beds occur in limestone of the Salina formation, Silurian system. Ontario's production is obtained from wells in the southwestern part of the province; plants are located at Courtright, Exeter, Goderich, Kincardine, Sandwich, Sarnia and Windsor. Considerable quantities of the brine are evaporated and the salt residue purified and marketed in several grades; the remainder is used in chemical plants at Sandwich and Amherstburg for the manufacture of bleaching powder, liquid chlorine, soda ash, and washing and caustic soda.

MANITOBA

Manitoba produced a small amount of salt in the Dauphin lake district during 1896. This salt was sold to the surrounding settlers.

SASKATCHEWAN

In 1921, the Senlac Salt Company operated a deposit near Senlac, Saskatchewan, for five months and produced 33 tons of common coarse salt. The open pan system of evaporation was used by this company. No further production has been recorded from this district.

ALBERTA

Rock salt was discovered at Fort McMurray in 1920 in a drill hole at a depth of 648 feet. Shipments of salt commenced from the Fort McMurray district during 1925 and continued in 1926 and 1927.

Table 385.—Production of Salt in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	62,359	227,195	1901.....	59,428	262,328	1916.....	132,903	717,653
1887.....	60,173	166,394	1902.....	64,456	292,581	1917.....	138,909	1,047,792
1888.....	59,070	185,460	1903.....	62,452	297,517	1918.....	131,727	1,285,039
1889.....	32,832	129,547	1904.....	69,477	321,778	1919.....	148,301	1,397,929
1890.....	43,754	198,857	1905.....	67,340	320,858	1920.....	209,855	1,544,724
1891.....	45,021	161,179	1906.....	76,720	329,130	1921.....	164,658	1,673,685
1892.....	45,486	162,041	1907.....	72,697	342,215	1922.....	181,794	1,628,323
1893.....	62,324	195,926	1908.....	79,975	378,798	1923.....	202,397	1,713,516
1894.....	57,199	170,687	1909.....	84,037	415,219	1924.....	207,979	1,374,780
1895.....	52,376	160,455	1910.....	84,092	409,624	1925.....	233,746	1,410,697
1896.....	43,960	169,693	1911.....	91,582	443,004	1926.....	262,547	1,480,149
1897.....	51,348	225,730	1912.....	95,053	459,582	1927.....	268,672	1,614,667
1898.....	57,142	248,639	1913.....	100,791	491,280			
1899.....	59,339	254,390	1914.....	107,038	493,648			
1900.....	62,055	279,458	1915.....	119,900	600,226	Total.....	4,312,964	25,682,493

Table 386.—Production of Salt in Canada, by Grades, 1926 and 1927

Grade	1926			1927		
	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)
	Tons	Tons	\$	Tons	Tons	\$
Table and dairy.....	50,642	50,905	762,491	53,649	53,477	802,922
Common fine.....	46,131	47,202	241,320	46,808	47,185	297,824
Common coarse.....	30,937	32,785	228,395	41,754	39,617	309,667
Land salt.....	4,170	3,965	16,865	5,955	5,829	37,072
Other grades.....	15,178	14,670	118,058	6,740	6,569	51,187
Brine for chemical works (Salt equivalent sold or used).....	113,020	113,020	113,020	115,995	115,995	115,995
Total.....	260,078	262,547	1,480,149	270,901	268,672	1,614,667
Value of packages.....			569,396			524,437
Grand total.....			2,049,545			2,139,104

Table 387.—Production in Canada, Imports, Exports and Consumption of Salt, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	233,746	1,410,697	262,547	1,480,149	268,672	1,614,667
IMPORTS—						
Salt, for the use of the sea or gulf fisheries	80,398	329,820	83,929	327,040	62,102	328,824
Salt, in bulk, n.o.p.....	73,166	327,364	75,965	393,747	72,933	321,538
Salt, n.o.p., in bags, barrels, etc.....	40,061	420,137	28,053	284,118	40,882	376,648
Salt, table, made by an admixture of other ingredients, when containing not less than 90 per cent of pure salt. (From April 1, 1926).....			454	31,689	844	55,070
Total.....	193,625	1,077,321	188,401	1,036,594	176,761	1,082,080
EXPORTS.....	2,324	26,678	1,164	19,423	1,212	22,793
APPARENT CONSUMPTION OF SALT.....	425,047	2,461,340	449,784	2,497,320	444,221	2,673,954

Table 388.—Principal Statistics of the Salt Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	11	12	2,406,992	368	412,597	356,794	404,046	1,713,516
1924.....	11	12	2,479,563	364	431,618	342,118	424,578	1,374,780
1925.....	12	13	2,563,508	402	467,487	315,368	(a)	1,410,697
1926.....	11	12	2,782,728	384	482,651	324,612	(a)	1,480,149
1927.....	10	11	3,194,802	376	499,967	287,260	(a)	1,614,667

(a) Data not available.

Table 389.—Capital Employed in the Salt Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	1,899,373	2,330,112
Cost of supplies and stocks on hand.....	270,076	321,007
Cash, trading and operating accounts and bills receivable.....	613,279	543,683
Total.....	2,782,728	3,194,802

Table 390.—Employees, Salaries and Wages in the Salt Industry in Canada, 1926 and 1927

	1926				1927			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
Salaried employees.....	41	10	51	\$ 121,014	40	14	54	\$ 121,100
Wage-earners.....	300	33	333	361,637	285	37	322	378,867
Total.....	341	43	384	482,651	325	51	376	499,967

Table 391.—Wage-Earners in the Salt Industry in Canada, by Months, 1926 and 1927

Month	1926		1927		Month	1926		1927	
	Male	Female	Male	Female		Male	Female	Male	Female
January.....	280	27	247	36	July.....	306	34	285	35
February.....	279	30	268	39	August.....	306	33	293	3
March.....	305	32	280	37	September.....	286	33	286	35
April.....	327	32	293	36	October.....	283	37	295	37
May.....	317	30	291	36	November.....	296	42	291	44
June.....	294	33	290	38	December.....	270	35	284	32

Table 392.—Fuel and Electricity Used in the Salt Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Imported.....	Ton.....	54,177	280,249	51,167	263,009
Lignite coal.....	Ton.....	2,763	19,065		
Fuel oil.....	Imp. gal.....			15,000	2,250
Gasoline.....	Imp. gal.....	5,600	1,168		
Wood.....	Cord.....	30	150	2	8
Other fuel.....	K.W.H.....		6,461		6,498
Electricity.....		1,131,352	17,519	1,361,491	15,495
Total.....			324,612		287,260

Table 393.—Power Employed in the Salt Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	30	752	22	567
Gasoline, gas and oil engines.....	3	62	4	440
Total primary power.....	33	814	26	1,007
Electric motors run by purchased power.....	54	659	69	878
Total power employed.....	87	1,473	95	1,885
Electric motors run by primary power in same plant.....	2	52	3	88
Total electric motors.....	56	711	72	966
Boilers.....	26	4,100	18	2,900

Table 394.—*World Production of Salt, 1913 and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
United Kingdom.....	2,203,732	1,886,882	2,045,762	1,933,590	1,727,443	1,933,486
Mauritius.....	(a)	1,500	1,500	1,500	1,500	1,500
Nigeria.....	394	400	400	400	400	400
Somaliland.....	(a)	1,707	1,446	2,336	2,077	2,367
South-West Africa Territory.....	(a)	(a)	335	425	400	400
Sudan.....	4,601	9,000	9,000	9,000	9,000	9,000
Tanganyika Territory.....	(a)	1,887	4,556	4,006	3,105	4,775
Union of South Africa.....	42,837	61,188	69,258	58,333	79,245	(a)
Canada.....	89,992	180,711	185,695	208,702	234,417	239,886
West Indies—						
Bahamas.....	26,000	2,680	1,570	1,291	7,358	1,893
Turks & Caicos Islands.....	(a)	58,060	52,327	62,432	53,958	27,923
Ceylon.....	13,190	28,279	9,263	20,263	15,962	(a)
Cyprus.....	(a)	766	22	3,000	3,000	3,000
India.....	1,472,764	1,900,829	1,623,475	1,295,144	1,638,749	1,611,945
Weihaiwei.....	(a)	2,000	2,000	2,000	2,000	2,000
Australia.....	64,981	98,286	110,687	126,251	139,101	123,212
Total.....	3,918,491	4,234,175	4,117,296	3,728,667	3,917,715	4,011,787
FOREIGN COUNTRIES						
Austria.....	358,887	81,953	109,382	128,705	142,849	145,741
Bulgaria.....	(a)	(a)	36,000	25,000	(a)	(a)
Czechoslovakia.....	See Austria	131,925	122,768	75,591	96,556	120,272
France.....	1,261,364	1,127,031	1,267,881	(b) 1,327,049	(b) 1,419,216	1,815,800
Germany.....	2,034,391	1,845,404	1,941,973	2,188,347	2,406,772	2,733,500
Greece.....	18,906	58,945	67,440	3,507	88,309	(a)
Italy.....	633,722	752,376	794,346	900,922	754,150	(a)
Jugoslavia.....	26,843	45,000	48,079	53,638	51,435	53,900
Netherlands.....	(a)	25,969	31,895	34,191	34,894	37,439
Poland.....	See Russia	357,468	365,217	423,197	450,277	530,792
Rumania.....	329,613	301,684	297,895	325,139	338,628	322,847
Russia.....	1,963,405	924,016	998,443	1,404,862	1,615,825	2,387,651
Spain.....	600,612	704,322	952,744	846,556	1,079,939	(a)
Switzerland.....	506,718	66,951	72,851	73,954	76,047	(a)
Algeria.....	26,566	24,676	23,163	26,579	42,534	36,353
Belgian Congo.....	79	80	80	80	80	80
Egypt (exports).....	154,640	154,758	206,584	207,795	177,617	219,020
Eritrea (estimated).....	19,678	20,000	20,000	20,000	20,000	20,000
Tripoli (estimated).....	(a)	(a)	(a)	19,000	19,000	19,000
Tunis.....	(a)	72,000	121,619	126,378	(a)	(a)
Dutch West Indies.....	13,201	11,605	8,751	18,087	(a)	(a)
Mexico (estimated).....	65,923	66,000	66,000	66,000	66,000	66,000
United States.....	4,298,638	6,366,708	6,074,210	6,604,909	6,581,786	6,757,759
Argentina.....	54,034	(a)	120,464	74,160	(a)	(a)
Chile.....	19,244	37,627	35,513	28,863	(a)	(a)
Colombia.....	28,534	29,000	29,000	29,000	29,000	29,000
Peru.....	24,040	26,096	28,513	23,002	28,661	(a)
Venezuela.....	(a)	30,000	30,000	30,000	30,000	30,000
China including Kwantung Peninsula (estimated).....	1,700,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Dutch East Indies.....	100,449	122,066	129,741	434,364	375,173	(a)
Formosa.....	72,869	235,400	134,000	136,000	133,059	(a)
French Indo-China.....	(a)	11,215	4,184	5,861	20,152	27,263
Japan.....	629,721	472,195	626,929	657,935	710,523	1,067,944
Portuguese India.....	11,807	12,000	12,000	12,000	12,000	12,000
Siam.....	(a)	32,428	39,923	124,094	123,685	113,534
Turkey.....	(a)	100,000	100,000	100,000	100,000	100,000
Philippine Islands.....	19,186	30,803	28,454	30,120	23,695	(a)
Total.....	14,973,070	16,277,701	16,946,042	18,584,885	17,432,042	18,145,395
Grand total.....	18,891,561	20,511,876	21,063,338	22,313,552	21,349,757	22,157,182

*Source prior to 1925.—Imperial Institute publications. Data for 1925 and 1926 obtained directly from the statistical bureaus of the different countries.

(a) Data not available.

(b) Exclusive of sea salt.

TALC AND SOAPSTONE

CANADA

Shipments of talc and soapstone ranging from 50 tons to 1,420 tons were made from Canadian deposits during the period 1886 to 1906. Prior to 1900 the production consisted mainly of impure talc and soapstone shipped from Quebec. It was not until 1900 that mining operations were commenced on the high grade talc deposits of the Madoc district. Ground talc was shipped from this district in 1906. Production advanced during the ensuing years until in 1920 the high mark for the industry was reached, namely, 21,671 tons valued at \$166,934, an average of \$7.70 per ton. In the following year the 4 companies operating employed 34 men and produced 10,124 tons with an average value of \$14.28 per ton. The 7 companies active in 1925 employed 82 men and shipped 14,474 tons valued at \$205,835. The improvement shown in the talc and soapstone industry in Canada during 1925 was continued throughout 1926 and shipments amounted to 15,767 tons valued at \$217,195. In 1927 a further advance was made to 16,521 tons worth \$236,105.

The Ontario production was made up of talc obtained from deposits in Hastings county and soapstone from the Grace mine near Vermilion Bay. Practically all of the Quebec shipments consisted of soapstone blocks for use in lining the alkali recovery furnaces of sulphate (kraft) pulp mills.

Importations of talc or soapstone, ground or unground, into Canada during 1927 were recorded at 4,907 tons evaluated at \$86,858, and exports of refined talc totalled 10,692 tons at \$125,123.

The capital employed by the 8 firms operating in this industry in Canada was reported at \$715,439 in 1927. Employment was furnished 13 salaried employees and 109 wage-earners; their total earnings were \$87,721. The expenditure for fuel and electricity was \$25,169. Primary power installation consisted of 11 units rated at 180 h.p.

QUEBEC

Although it is known that early settlers made use of soapstone from deposits in Quebec for lining fireplaces and ovens and for footwarmers, the first official records of the mining of soapstone are for 1871 when 300 tons valued at \$1,800 were shipped from a deposit in Bolton township, Brome county. Small shipments were made from Quebec deposits from 1886 to 1889. In 1920, the production amounted to 150 tons with a valuation of \$1,050. Soapstone blocks totalling 150 tons worth \$4,950 were shipped in 1922 from Thetford township to sulphate process pulp mills for use in lining the alkali recovery furnaces. In 1927 shipments reached the total of 1,276 tons valued at \$51,504 and consisted principally of soapstone blocks.

An excerpt from a report on the soapstone industry by Hugh S. Spence follows:—

Canadian sulphate pulp mills are estimated to use in the neighbourhood of 2,500 tons of soapstone per year. This stone is employed in the form of sawn blocks and bricks for building the furnaces used in recovery of the alkali or black liquor from the digestors, and is the only natural product known that will satisfactorily resist the action of the molten alkali. Since the recovery of such alkali is of great import in kraft mill practice, it follows that soapstone is a very important material to the pulp mill operators.

In the province of Quebec, however, the most active development has been undertaken, operations here having been helped by the fact that many of the largest kraft mills are situated in the province, within a relatively short rail haul from the deposits. Production has, in the main, been confined so far to a single operator, the Robertsonville Soapstone Quarry Company, which has opened up a number of small quarries in the eastern portion of the serpentine belt, with which are associated the principal asbestos mines. Small portable sawing units, driven by individual gasoline engines, are used to cut the stone into blocks and bricks of the dimensions specified by the mills. Most of the quarries opened by the company in its initial stages have now been abandoned, and work is at present confined to a single quarry, where the stone has been found to be of superior quality to that hitherto worked. It is the intention of the company to instal permanent equipment at this point, and to undertake operations on a larger scale, with a view to taking care of the entire soapstone requirements of Eastern Canada. It is also proposed to grind the quarry waste, making products suited to the roofing and foundry trades.

While a certain amount of soapstone continues to be imported from the United States and from Scandinavian countries, it is gratifying to note that Canada seems now well on the way to filling her requirements in respect to this material from within her own borders.

ONTARIO

Madoc is the centre of the production of talc in Ontario. In 1899 the Henderson, the first mine in this district, was opened up on concession XIV, lot 14, Huntingdon township, and a small shipment of crude talc was made to the United States during that year. The first mill for the fine grinding of talc in Canada was erected at Madoc in 1906 and since then the Ontario production has increased materially. Operations on the Eldorado property, about 2 miles northwest of Eldorado station, were commenced in 1911 and were discontinued in 1920. The present Connolly mine was discovered in 1911 and mining operations commenced on it during the following year. A mill was constructed on the property in 1916 and operations have been almost continuous since that date.

Work was started on the H. H. Wood soapstone deposit near Mine Centre in 1922. During that year and also in 1923 some experimental shipments were made in addition to the sawing and sale of a small quantity of steel workers' crayons. Mining was commenced on the Grace property at Vermilion Bay in 1924 and shipments have been reported from this mine during the past three years.

BRITISH COLUMBIA

The Lucky Jane claim near D'Arcy station on the Pacific Great Eastern Railway was operated in 1916 and 1917. Operations on the Eagle deposit near Wolf creek, Vancouver island commenced early in 1919 and continued to the end of 1925. Shipments from this deposit were resumed in 1927. The crude material was shipped to the operator's mill at Sydney, Vancouver island, during the period 1919 to 1921 but in the latter year a plant was constructed on the property. Mill output consisted of: first grade, for use in the paint industry; second grade, for paper mills; and coarse for use in the preparation of roofing paper.

Table 395.—Production of Talc and Soapstone in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	50	400	1901.....	259	842	1916.....	13,104	49,423
1887.....	100	800	1902.....	689	1,804	1917.....	15,803	76,539
1888.....	140	280	1903.....	990	2,739	1918.....	18,169	119,197
1889.....	195	1,170	1904.....	840	1,875	1919.....	18,642	116,295
1890.....	917	1,239	1905.....	500	1,800	1920.....	21,671	166,934
1891.....			1906.....	1,234	3,030	1921.....	10,124	144,565
1892.....	1,374	6,240	1907.....	1,534	4,662	1922.....	13,195	188,458
1893.....	717	1,920	1908.....	1,016	3,048	1923.....	10,366	150,507
1894.....	916	1,640	1909.....	4,350	10,300	1924.....	11,332	154,480
1895.....	475	2,138	1910.....	7,112	22,308	1925.....	14,474	205,835
1896.....	410	1,230	1911.....	7,300	22,100	1926.....	15,767	217,195
1897.....	157	350	1912.....	8,270	23,132	1927.....	16,521	236,105
1898.....	405	1,000	1913.....	12,250	45,980			
1899.....	450	1,960	1914.....	10,808	40,418			
1900.....	1,420	6,365	1915.....	11,885	40,554	Total.....	255,931	2,076,797

Table 396.—Production in Canada, Imports and Exports of Talc and Soapstone, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Soapstone.....	768	32,655	995	42,609	1,411	57,174
Talc.....	13,706	173,180	14,772	174,586	15,110	178,931
Total.....	14,474	205,835	15,767	217,195	16,521	236,105
IMPORTS—						
Talc or soapstone, ground or unground..	4,568	91,288	4,213	89,026	4,907	86,858
EXPORTS—						
Talc, crude.....					12	154
Talc, refined.....	10,461	124,217	10,823	125,633	10,692	125,123

Table 397.—Principal Statistics of the Talc and Soapstone Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	6	6	679,337	60	59,321	15,504	49,239	150,507
1924.....	6	6	695,786	61	59,220	18,351	(a)	154,480
1925.....	7	7	744,037	92	74,519	22,218	(a)	205,835
1926.....	6	6	681,434	92	74,634	25,023	(a)	217,195
1927.....	8	9	715,439	122	87,721	25,169	(a)	236,105

(a) Data not available.

Table 398.—Capital Employed in the Talc and Soapstone Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	600,797	637,365
Cost of all supplies and stocks on hand.....	36,801	36,114
Cash, trading and operating accounts and bills receivable.....	43,836	41,960
Total.....	681,434	715,439

Table 399.—Employees, Salaries and Wages in the Talc and Soapstone Industry in Canada, 1926 and 1927

	1926				1927			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
				\$				\$
Salaried employees.....	8	1	9	14,940	11	2	13	15,198
Wage-earners.....	83		83	59,694	109		109	72,523
Total.....	91	1	92	74,634	120	2	122	87,721

Table 400.—Wage-Earners in the Talc and Soapstone Industry in Canada, by Months, 1926 and 1927

Month	1926	1927	Month	1926	1927
January.....	59	81	July.....	80	101
February.....	74	79	August.....	78	90
March.....	75	84	September.....	75	92
April.....	85	87	October.....	72	81
May.....	80	87	November.....	67	84
June.....	80	91	December.....	63	84

Table 401.—Fuel and Electricity Used in the Talc and Soapstone Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal—Imported.....	Ton.....	493	3,782	354	2,302
Gasoline.....	Imp. gal.....	310	117	1,483	420
Wood.....	Cord.....	746	2,610	765	2,877
Electricity.....	K.W.H.....	1,400,000	18,514	1,467,700	19,570
Total.....			25,023		25,169

Table 402.—Power Employed in the Talc and Soapstone Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	3	170	6	100
Gasoline, gas and oil engines.....	8	58	5	80
<i>Total primary power.....</i>	<i>11</i>	<i>228</i>	<i>11</i>	<i>180</i>
Electric motors run by purchased power.....	13	595	17	683
Total power employed.....	24	823	28	863
<i>Total electric motors.....</i>	<i>13</i>	<i>595</i>	<i>17</i>	<i>683</i>
Boilers.....	4	250	4	230

Table 403.—*World Production of Talc and Soapstone, 1913 and 1923-1927

(Long tons)

Country	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
United Kingdom.....	40	186				
Union of South Africa.....		317	670	85	41	344
Canada.....	10,937	9,255	10,118	12,923	14,078	14,751
India.....	2,524	7,024	2,852	8,525	9,674	5,053
Australia.....	104	622	859	1,052	911	1,069
Total.....	13,605	17,404	14,499	22,585	24,704	21,217
FOREIGN COUNTRIES						
Austria (exports).....	7,953	7,369	9,433	12,679	13,642	16,863
China.....		188	218	50	(a)	(a)
France.....	59,208	47,967	68,250	68,256	(a)	(a)
Germany (Bavaria).....		1,876	3,933	3,405	3,772	(a)
Greece.....		150	137	92	149	137
Italy.....	44,622	30,649	28,171	33,089	42,355	(a)
Norway (exports).....	2,392	8,784	11,596	8,889	7,483	7,487
Spain.....	4,336	1,951	1,434	898	3,800	(a)
Sweden.....		2,391	2,827	2,337	2,876	3,420
United States.....	156,994	175,618	181,983	(b) 162,727	(b) 162,113	171,711
Uruguay (exports).....		980	(a)	899	883	1,085
Japan.....		35,341	41,194	43,885	(a)	(a)
Total.....	275,505	313,224	349,176	336,706	237,078	200,703
Grand total.....	289,110	330,628	363,675	359,291	261,782	221,920

*Source prior to 1925—Imperial Institute publications. Data for 1925 and 1926 obtained directly from the statistical bureaus of the different countries.

(a) Data not available.

(b) Talc only.

MISCELLANEOUS NON-METAL MINING INDUSTRIES

Included under this heading are the following non-metallic minerals:

Actinolite	Mineral waters
Barytes	Natro-alunite
Bituminous sands	Phosphate
Fluorspar	Pyrites
Lithium minerals	Silica brick
Magnesite	Sodium carbonate
Magnesium sulphate	Sodium sulphate

Statistics relating to capital, labour, fuel and power are combined for these industries and are shown in Tables 404 to 430.

In addition to the foregoing, data are also shown for production, imports and exports of sulphuric acid.

Table 404.—Principal Statistics of the Miscellaneous Non-Metal Mining Industries in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	26	27	4,682,838	185	254,088	56,817	151,501	296,814
1924.....	30	31	2,428,619	136	82,937	14,948	129,904	240,718
1925.....	28	28	2,080,481	218	149,655	58,437	(a)	273,327
1926.....	28	28	2,400,850	193	201,468	79,877	(a)	386,892
1927.....	32	32	3,315,380	304	313,338	85,302	(a)	670,950

(a) Data not available.

Table 405.—Capital Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	2,234,931	2,972,352
Cost of supplies and stocks on hand.....	109,812	222,876
Cash, trading and operating accounts and bills receivable.....	56,107	120,152
Total.....	2,400,850	3,315,380

Table 406.—Employees, Salaries and Wages in the Miscellaneous Non-Metal Mining Industries, 1926 and 1927

	1926				1927			
	Number of employees			Salaries and wages	Number of employees			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	20	2	22	35,790	27	4	31	45,910
Wage-earners.....	171		171	165,678	273		273	267,428
Total.....	191	2	193	201,468	300	4	304	313,338

Table 407.—Wage-Earners in the Miscellaneous Non-Metal Mining Industries, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	122	179	July.....	175	249
February.....	117	117	August.....	142	259
March.....	112	170	September.....	153	289
April.....	108	217	October.....	186	296
May.....	173	281	November.....	184	281
June.....	182	310	December.....	131	211

Table 408.—Fuel and Electricity Used in the Miscellaneous Non-Metal Mining Industries in Canada, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton.....			2	30
Bituminous coal—Canadian.....	Ton.....			2,037	12,311
Bituminous coal—Imported.....	Ton.....	7,775	43,496	4,203	27,003
Fuel oil.....	Imp. gal.....	313,719	29,198	299,956	23,827
Gasoline.....	Imp. gal.....	480	131	2,177	618
Wood.....	Cord.....	632	1,365	2,064	6,418
Gas—manufactured.....	M cu.ft.....			3,533	283
Other fuel.....					528
Electricity.....	K.W.H....	765,883	5,687	1,477,284	14,284
Total.....			79,877		85,302

Table 409.—Power Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	4	305	7	330
Gasoline, gas and oil engines.....	2	9	5	184
Hydraulic turbines.....			3	300
<i>Total primary power.....</i>	<i>6</i>	<i>314</i>	<i>15</i>	<i>814</i>
Electric motors run by purchased power.....	25	1,143	23	1,059
Total power employed.....	31	1,457	38	1,873
Electric motors run by primary power in same plant.....	7	282	17	681
<i>Total electric motors.....</i>	<i>32</i>	<i>1,425</i>	<i>40</i>	<i>1,740</i>
Boilers.....	5	425	5	260

ACTINOLITE

CANADA

Actinolite, which is a calcium-magnesium-iron silicate, is used in the manufacture of coal-tar roofing compounds. Mining of this mineral in Canada commenced in 1883. Canadian deposits from which production has been derived are located in Elzevir and Kaladar townships, Hastings county: Actinolite is the centre of the industry. In 1902 and 1903 production was at its peak and 550 tons were shipped; however, during the following six years, no operations were carried on. Shipments recommenced in 1910 and have continued up to the present. Annual production of ground actinolite during the past 8 years had ranged between 40 tons and 100 tons. In 1927, shipments to the United States amounted to 86 tons valued at \$1,075 as compared with 80 tons at \$1,000 shipped in 1926.

Table 410.—Production of Actinolite in Canada, 1897-1927

Year	Tons	Value	Year	Tons	Value
		\$			\$
1897.....	205	1,845	1917.....	120	1,320
1898-1900.....			1918.....	228	2,508
1901.....	521	3,126	1919.....	80	680
1902.....	550	4,400	1920.....	100	1,160
1903.....	550	3,108	1921.....	78	975
1904-1909.....			1922.....	50	575
1910.....	30	330	1923.....	53	583
1911.....	67	736	1924.....	90	1,225
1912.....	92	1,000	1925.....	40	500
1913.....	66	720	1926.....	80	1,000
1914.....	119	1,304	1927.....	86	1,075
1915.....	220	2,420			
1916.....	250	2,750	Total.....	3,675	33,540

BARYTES

CANADA

Deposits of barytes at Five Islands, Colchester county, and Brookfield, Hants county, Nova Scotia were first operated between 1865 and 1870. These deposits have produced about 5,000 tons of barytes. The McKellar Island deposit in Thunder Bay district, Ontario, in the course of its operations produced several thousand tons of ore. Work ceased on this property in 1894.

Large deposits of barytes at Lake Ainslie, Cape Breton island, were opened up in 1894 and operations in this district have been practically continuous since that date. Between 1900 and 1903 the Cap Rouge deposit in North Cheticamp district was operated.

During 1918 a deposit in Langmuir township, Ontario, was operated and a mill for grinding and preparing barytes was completed shortly before the close of navigation. A shipment of 60 tons was made. Development work was done on the Bellew mine in North Burgess township in 1918. A deposit near Tionaga station was operated in 1923 and 200 tons of barytes were shipped.

Barytes shipped during 1927 amounted to 56 tons valued at \$1,268 as compared with 100 tons worth \$2,307 produced in 1926. The total output as in the past two years was obtained from the Johnston mine at Lake Ainslie, Inverness county, Nova Scotia.

Importations of barytes into Canada show little variation annually; the 1927 imports were recorded at 2,841 tons, while in 1926 a total of 2,422 tons was brought into Canada.

NOVA SCOTIA

The Five Islands and Brookfield deposits were first worked between 1865 and 1870, but operations here practically ceased in 1880. Approximately 5,000 tons have been shipped from these properties.

A description of the Five Islands deposit contained in H. S. Spence's report on *Barium and Strontium* follows:—

The deposit lies about 2 miles north of the village of Five Islands, on the north shore of the Minas basin. Shipment of ore can be made by boat. All the barytes shipped from the property was crude ore, and most of it went to the United States. Shipments were also made to the paint works of the Dolphin Manufacturing Company, St. Catharines, Ont.

The initial work on the deposit was carried out by Mr. Sewell, of Bath, Maine, and from 1866 to 1876, about 3,000 tons of barytes are reported to have been extracted and shipped. Beyond some work of a prospecting nature in 1907, no further mining appears to have been conducted since 1876.

The Stewiacke deposit near Brookfield station was opened up about 1868 and work on it ceased in 1899.

Between 1870 and 1880 the Sellar's mine at Hodson, five miles from River John, Pictou county, shipped about 500 tons of barytes to Portland, Maine.

Production in the Lake Ainslee district, Inverness county, began in 1894 with some shipments of barytes from the Johnston mine to Halifax for grinding. The Johnston mine continues to furnish a small production annually for use in the paint industry. The East Lake Ainslee group of properties was opened up in 1903 and operated about five years, producing between 7,000 tons and 8,000 tons.

QUEBEC

Shipments of barytes were made from a deposit in Hull township during the period 1898-1900. This barytes was shipped to Montreal, for use in the manufacture of paint. Operations on this deposit ceased about 1900.

ONTARIO

The McKellar Island deposit in Thunder Bay District, was discovered in 1869 and work on it commenced several years later. Considerable tonnage of barytes have been shipped from this property; the last shipment amounting to 500 tons was made in 1894.

In 1910 the first barytes deposit was discovered in northern Ontario in Langmuir township. Mining operations on this property commenced in 1915 and in 1918 a mill for the grinding and preparing of barytes for market was completed. During that year a trial shipment of 60 tons was made. Following the discovery of the Langmuir deposit, the Biederman claim in Cairo township; the Eby claim in Lawson township and the Ontario Barium Company's deposit in Yarrow township were located. The Tionaga property in Penhorwood township was discovered in 1917. In the following years some development work was done on the deposit and in 1923 a shipment of 200 tons was made. In Bathurst, Levant and North Burgess townships development work has been done on barytes occurrences.

Table 411.—Production of Barytes in Canada, 1885-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1885.....	300	1,500	1900.....	1,337	7,605	1915.....	550	6,875
1886.....	3,864	19,270	1901.....	653	3,842	1916.....	1,368	19,393
1887.....	400	2,400	1902.....	1,096	3,957	1917.....	3,490	54,027
1888.....	1,100	3,850	1903.....	1,163	3,831	1918.....	640	10,165
1889.....			1904.....	1,382	3,702	1919.....	468	8,154
1890.....	1,842	7,543	1905.....	3,360	7,500	1920.....	751	22,983
1901.....			1906.....	4,000	12,000	1921.....	270	9,567
1892.....	315	1,260	1907.....	1,344	3,000	1922.....	289	9,537
1893.....			1908.....	4,312	19,021	1923.....	409	8,548
1894.....	1,081	2,830	1909.....	179	1,120	1924.....	151	3,308
1895.....			1910.....			1925.....	95	2,259
1896.....	145	715	1911.....	50	400	1926.....	100	2,307
1897.....	571	3,060	1912.....	464	5,104	1927.....	56	1,268
1898.....	1,125	5,533	1913.....	641	5,410			
1899.....	720	4,402	1914.....	612	6,169	Total.....	40,693	293,515

Table 412.—Production in Canada and Imports of Barytes, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	95	2,259	100	2,307	56	1,268
IMPORTS—						
Barium peroxide.....	31	7,488	11	2,311	35	3,195
Blanc fixé.....	303	19,343	427	22,645	511	28,053
Barytes.....	2,433	50,566	2,422	48,011	2,841	58,504
Lithopone.....	5,290	437,391	6,295	520,249	7,902	644,175
Satin white.....	778	21,486	1,055	29,714	1,044	29,528

BITUMINOUS SANDS

CANADA

Bituminous sands are found in the Fort McMurray district, Alberta. This deposit is the largest occurrence of solid asphaltic material known. Considerable research work has been done in connection with these sands by the *Scientific and Industrial Research Council* of Alberta and the *Dominion Department of Mines*. Shipments of bituminous sands up to 1924 amounted to 531 tons. In 1925, the production was 1,148 tons at \$4,594; in 1926, shipments totalled 528 tons at \$2,112; and in 1927, the total was 2,706 tons valued at \$10,824. During these three years, the McMurray Asphaltum and Oil Company and the Federal Department of Mines were the only producers.

Table 413.—Production of Bituminous Sands in Canada and Imports of Asphalt, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Bituminous sands.....	1,148	4,594	528	2,112	2,706	10,824
IMPORTS—						
Asphalt, solid.....	12,583	292,218	19,663	404,848	47,737	856,225
Asphalt, not solid.....		13,288		17,510		38,566
Asphaltum oil.....		12,147		21,993		70,986
Total.....		317,653		444,356		965,777

FLUORSPAR

CANADA

The first recorded shipment of fluorspar from a Canadian deposit was made in 1905, when 12 tons were shipped from a mine in Madoc township, Ontario. Five years later about 200 tons were mined in Huntingdon township of which quantity 2 tons were shipped. In 1911, the metallurgical works at Deloro and the steel foundries at Welland received small shipments. The next year a further small production was recorded, however in the following three years no shipments were made. During 1916, Ontario companies shipped 1,284 tons and increasing tonnages were produced during 1917 and 1918. In the latter year British Columbia became a factor in this industry as the Rock Candy mine near Grand Forks commenced operations.

The largest production from Canadian deposits took place in 1920 when 11,235 tons were shipped. Four mines were operated in that year employing 119 men whose wages totalled \$123,050.

No shipments of fluorspar were made from Canadian deposits during 1926 and 1927. In 1925 the production amounted to 3,886 tons with a valuation of \$19,234. Importations of fluorspar into Canada showed a marked drop in 1927 and amounted to 4,561 tons worth \$58,701 as against 9,968 tons appraised at \$97,482 in 1926.

ONTARIO

A small shipment of fluorspar was made in 1905 from a deposit near Madoc, to Port Hope. During 1910 considerable development work was done on a deposit in Huntingdon township and 200 tons of ore were extracted. In the following year 34 tons were shipped to Deloro and Welland and in 1912 a shipment of 40 tons was made to Copper Cliff. Three properties were operated near Madoc in 1916 from which 525 tons were shipped to the United States and 759 tons to Canadian steel companies. In 1918 eight deposits were in operation in the Madoc district and shipments totalled 7,187 tons averaging \$20.97 per ton. The major part of these shipments went to Hamilton, Welland, Toronto and other Ontario points, in addition to which some exports were made to the United States. This was the high mark for the industry in Ontario and employment was furnished 129 men earning \$85,783. Production from 1921 to 1925 was practically negligible while in 1926 shipments ceased entirely.

BRITISH COLUMBIA

Fluorspar production in British Columbia commenced in 1918 with the opening up of the Rock Candy mine near Grand Forks. The 1918 shipments amounted to 175 tons; the following year 1,638 tons were shipped; and in 1920, the maximum production for the province, namely, 7,477 tons was recorded. Production was fairly well maintained, during the next two years however, in 1923 only 75 tons were shipped and in 1924 none was produced. The mine was re-opened for three months in 1925 and 3,874 tons were taken out, but in 1926 and 1927 there were no shipments. When active the concentrating mill on this property produced 88.5 per cent calcium fluoride and 5.3 per cent silica. This material is shipped to Trail for the manufacture of hydrofluosilicic acid. In addition to this local consumption considerable quantities have been exported to the United States.

Table 414.—Production of Fluorspar in Canada, by Provinces, 1905-1927

	Ontario		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1905.....	12				12	
1906-1909.....						
1910.....	2	15			2	15
1911.....	34	238			34	238
1912.....	40	240			40	240
1913-1915.....						
1916.....	1,284	10,238			1,284	10,238
1917.....	4,249	68,756			4,249	68,756
1918.....	7,187	150,779	175	5,250	7,362	156,029
1919.....	3,425	59,281	1,638	38,556	5,063	97,837
1920.....	3,758	68,475	7,477	171,971	11,235	240,446
1921.....	116	1,744	5,403	134,523	5,519	136,267
1922.....	284	3,905	4,219	98,233	4,503	102,138
1923.....	64	597	75	1,135	139	1,732
1924.....	76	1,343			76	1,343
1925.....	12	200	3,874	19,034	3,886	19,234
1926-1927.....						
Total.....	20,543	365,811	22,861	468,702	43,404	834,513

Table 415.—Production in Canada and Imports of Fluorspar, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Ontario.....	12	200				
British Columbia.....	3,874	19,034				
Total.....	3,886	19,234				
IMPORTS—						
Hydrofluosilicic acid.....	2.18	636	2	565	5	811
Fluorspar.....	5,111	60,458	9,968	97,482	4,561	58,701

LITHIUM MINERALS

CANADA

In a statement prepared by J. F. Wright, *Federal Department of Mines*, Ottawa, Canada, on the subject of lithium minerals, there are the following remarks:—

An outcrop of massive lepidolite was discovered in July, 1924, about one mile south of the Winnipeg river, some 10 miles east and a little north of Pointe du Bois. The Manitoba lithium deposits are the only ones of possible commercial value known within the British Empire.

At the Silver Leaf Mining Syndicate deposit, the lithium minerals occur in pockets and lenses in the central portion of a body of pegmatite which is exposed for 125 feet in a general east-west direction and across an average width of 80 feet. An analysis of a hand-picked sample, judged to represent approximately the lithium-bearing rock after the gangue has been removed, gave 4.76 per cent lithia (Li_2O). There is

estimated to be between 2,500 and 3,000 tons of this type of ore for each 10 feet in depth within a horizontal area equal to that at the surface. Two lens-shaped bodies of lepidolite, or a lithia mica of like character, estimated to contain about 540 tons of lithia ore for each 10 feet in depth and averaging 3.87 per cent lithia, occur near the south side of the pegmatite mass. This lithia mica contains only one-tenth of one per cent iron (Fe_2O_3), and therefore probably will be found satisfactory for the manufacture of opal, white and flint glass.

Active development commenced in 1925, camps being put up, and a compressor, drills, and gasoline engines installed. Three miles of pole tram-line and winter road were built to a point on the Winnipeg river a short distance below Lamprey Falls. A considerable tonnage of ore has been blasted out and some small shipments made to England, Germany and the United States. Transportation is not difficult as barges may be floated down the river to the railhead, Pointe du Bois.

MAGNESITE

CANADA

Magnesite was discovered in Grenville township in 1900 but it was not until 1907 that work on a small scale was started on the deposits. The following year 120 tons were shipped for the manufacture of carbonic acid gas for the aerated waters industry and for use in making flooring cement.

The cutting off of the Austrian supply of magnesite to North America in 1914 brought attention to the Grenville deposits as a substitute in the manufacture of refractory brick and lining for metallurgical furnaces.

Operations in 1915 accounted for the employment of 110 men whose wages amounted to \$23,607 and the year's production was 14,779 tons. The next year 183 men were employed earning \$144,987 and producing 55,413 tons. From the point of tonnage produced 1917 was the record year for the magnesite industry in Canada as 58,090 tons were shipped with an average value of \$12.54 per ton; 296 men were on the payrolls with wages totalling \$194,864. Advances in prices took place in 1918 and consequently, although the production of 39,365 tons was 32.5 per cent less than the previous year, the value of \$1,016,765 was a record one for the industry. In 1918 employment was furnished 305 men who received \$326,417.

The hydromagnesite deposits near Atlin, British Columbia, were operated during 1915 and 1916; shipments recorded for the latter year amounted to 635 tons and were made to the eastern United States and to Great Britain. During 1921 a further shipment of 803 tons was made from these deposits. However, there has been no production since that date.

The Canadian production fell off sharply in 1921 to 3,730 tons but recovered somewhat in 1923 to 4,801 tons. In 1925 shipments totalled 5,576 tons valued at \$122,325; during 1926 a total of 4,571 tons were shipped with a valuation of \$137,431. An appreciable increase was recorded in the shipments of magnesite in 1927, when 7,337 tons worth \$230,309 were produced.

All the magnesite mined during 1927 was produced in the province of Quebec and was sold in two forms, namely, dead-burned and calcined. Dead-burned magnesite is used entirely in the metallurgical industry as a refractory lining for furnaces. Calcined magnesite is used as a plastic material for floors and walls in buildings and also in the manufacture of pipe and furnace coverings, as it has strong insulating properties.

Exports of calcined and dead-burned magnesite were recorded at 1,953 tons worth \$47,487 in 1927 as compared with 653 tons at \$19,587 exported in the previous year.

The New Tariff Act of 1922 on Imports into United States, which came into effect in September, provided the following duties on the various forms of magnesite; Crude magnesite, $\frac{5}{16}$ of 1 cent per pound; caustic calcined magnesite, $\frac{5}{8}$ of 1 cent per pound; dead burned and grain magnesite, not suitable for manufacture into oxychloride cements, $\frac{2}{10}$ of 1 cent per pound.

Table 416.—Production of Magnesite in Canada, 1908-1927

Year	Tons	Value	Year	Tons	Value
		\$			\$
1908.....	120	840	1919.....	11,273	328,465
1909.....	330	2,508	1920.....	18,378	512,756
1910.....	323	2,160	1921.....	3,730	81,320
1911.....	991	5,531	1922.....	2,849	76,294
1912.....	1,714	9,645	1923.....	4,801	134,382
1913.....	515	3,335	1924.....	3,873	101,356
1914.....	358	2,240	1925.....	5,576	122,325
1915.....	14,779	126,584	1926.....	4,571	137,431
1916.....	55,413	563,829	1927.....	7,337	230,309
1917.....	58,090	728,275			
1918.....	39,365	1,016,765	Total.....	234,386	4,186,350

Table 417.—Production in Canada, Imports and Exports of Magnesite, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Crude, mined.....	4,219	.....	12,598	.....	20,418	.....
Crude, calcined.....	6,210	.....	9,870	.....	18,593	.....
PRODUCTION—						
Crude.....	1,507	6,406	.....	.....	.....	.....
Calcined.....	4,069	115,919	4,571	137,431	7,337	230,309
Dead-burned.....						
Total.....	5,576	122,325	4,571	137,431	7,337	230,309
IMPORTS—						
Magnesia pipe covering.....	.....	108,681	.....	122,411	.....	157,982
Magnesite.....	111	4,528	150	6,746	166	5,805
Magnesite firebrick.....	.....	75,161	.....	66,429	.....	118,457
EXPORTS—						
Magnesite, calcined or dead-burned.....	834	21,401	653	19,587	1,953	47,487

Table 418.*—World Production of Magnesite, 1913 and 1923-1927

(Long tons)

Producing country and description	1913	1923	1924	1925	1926	1927
BRITISH EMPIRE						
Cyprus—						
Crude magnesite.....		280	220			
Union of South Africa—						
Crude magnesite.....	396	1,365	1,970	1,795	1,854	1,720
Canada—						
Crude magnesite (mined).....		8,442	9,362	3,767	11,248	18,231
Caustic magnesite.....		107	1,370			
Dead-burnt magnesite.....		4,179	2,088	4,979	4,081	6,551
India—						
Crude magnesite.....	16,198	19,436	24,461	29,620	30,461	19,638
Australia—						
Crude magnesite.....	7,104	6,372	12,850	14,721	10,583	10,419
FOREIGN COUNTRIES						
Austria†—						
Crude magnesite (exports).....	197,717	2,213	1,607	336	290	(a)
Caustic magnesite (b).....	(a)	5,230	6,269	10,425	7,813	(a)
Dead-burnt magnesite (b).....	(a)	83,418	72,713	76,788	76,219	(a)
Czechoslovakia—						
Crude magnesite (b).....			4,738	7,098	12,374	11,550
Calcined magnesite (b).....			25,885	29,207	33,070	34,132
Greece—						
Crude magnesite.....	116,157	61,547	64,655	89,394	94,128	65,673
Caustic magnesite.....	(a)	19,812	20,058	28,829	26,368	(a)
Dead-burnt magnesite.....	(a)	1,534	1,124		1,194	(a)
Italy—						
Crude magnesite.....	590	12,274	13,220	14,907	19,529	16,000
Norway—						
Crude magnesite.....	645	2,321	1,944	1,672	703	1,073
Calcined magnesite (exports).....	(a)	713	458	445	198	262
Magnesia bricks (exports).....	(a)	490	516	405	304	269
Russia—						
Crude magnesite.....		15,181	(a)	74,642	101,390	104,900
Caustic magnesite.....				2,190	2,046	(a)
Dead-burnt magnesite.....			14,243	19,691	27,232	(a)
Magnesia bricks.....				10,535	11,865	(a)
Spain—						
Crude magnesite.....	943					
United States—						
Crude magnesite.....	8,600	131,473	107,232	107,732	119,200	108,473

*Source—Imperial Mineral Resources publications.

†Crude magnesite produced in 1927—350,000 tons.

(a) Data not available.

(b) Exports less imports.

MAGNESIUM SULPHATE

CANADA

In 1915 work commenced on the Spotted Lake deposit of magnesium sulphate, near Kruger mountain, Osoyoos division, British Columbia. Shipments were made of this material to the drug trade during 1915 and 1916. Crude magnesium sulphate to a total of 2,600 tons was extracted in 1917 of which quantity 929 tons were shipped to Oroville, Washington. The following year a deposit near Clinton, Lillooet district, was also operated. Preliminary shipments were made in 1920 from several lakes, containing these salts, on the Basque ranch, near Ashcroft, British Columbia.

No activities have been reported in this industry in Canada since 1923. In that year 121 tons of refined magnesium sulphate were shipped from the Basque ranch deposit.

The importations of magnesium sulphate or epsom salts during 1927 reached a total of 2,404 tons valued at \$39,195. The average value for this period's imports was somewhat lower than that reported for 1926, when 2,131 tons at \$39,016 were brought into Canada. During 1925, imports totalled 2,137 tons invoiced at \$45,181.

Table 419.—Production of Magnesium Sulphate in Canada, 1917-1927

Year	Tons	Value
		\$
1917.....	929	4,645
1918.....	1,949	14,565
1919.....	738	9,115
1920.....	1,947	39,886
1921.....	2,029	39,506
1922.....	1,021	24,017
1923.....	121	6,580
1924-1927.....		
Total.....	8,734	138,314

MINERAL WATERS

CANADA

A record of all the natural mineral waters produced in Canada and sold to the general public for medicinal purposes since 1888 has been compiled. In that year 124,850 imperial gallons were produced and during the following ten years production varied between 424,600 gallons and 767,460 gallons. However, from 1899 to 1920 only the value of the shipments has been recorded; the high mark for the industry was reached in 1911 when the production was valued at \$223,758. Since 1920 shipments have fallen off to a marked degree; in 1922, production was 221,433 gallons worth \$14,220. During 1925, a total of 190,134 gallons valued at \$28,413 was produced and in 1926 a slight increase was recorded when 215,356 imperial gallons with a valuation of \$29,721 were shipped from Quebec and Ontario springs and wells. In 1927, shipments amounted to 303,530 gallons valued at \$14,624, consisting of 10,330 gallons from Quebec and 293,200 gallons from Ontario.

Table 420.—Production of Mineral Waters in Canada, 1888-1927

Year	Imp. gal.	Value	Year	Value	Year	Imp. gal.	Value
		\$		\$			\$
1888.....	124,850	11,456	1900.....	75,000	1913.....		173,677
1889.....	424,600	37,360	1901.....	100,000	1914.....		134,111
1890.....	561,165	66,031	1902.....	100,000	1915.....		115,274
1891.....	427,485	54,268	1903.....	100,000	1916.....		127,806
1892.....	640,380	75,348	1904.....	100,000	1917.....		145,814
1893.....	725,096	108,347	1905.....	100,000	1918.....		154,468
1894.....	767,460	110,040	1906.....	100,000	1919.....		71,015
1895.....	739,382	126,048	1907.....	136,020	1920.....		24,582
1896.....	706,372	111,736	1908.....	151,953	1921.....	328,273	21,716
1897.....	749,691	141,477	1909.....	175,173	1922.....	221,433	14,220
1898.....	555,000	100,000	1910.....	199,563	1923.....	232,451	16,455
1899.....		100,000	1911.....	223,758	1924.....	209,353	15,421
			1912.....	172,465	1925.....	190,134	28,413
					1926.....	215,356	29,721
					1927.....	303,530	14,624
					Total.....		3,863,360

Table 421.—Production in Canada, Imports and Exports of Mineral Waters, 1925-1927

	1925		1926		1927	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		\$		\$		\$
PRODUCTION, by provinces—						
Quebec.....	7,122	2,961	6,956	2,444	10,330	1,813
Ontario.....	183,012	25,452	208,400	27,277	293,200	12,811
Total.....	190,134	28,413	215,356	29,721	303,530	14,624
IMPORTS—Mineral and aerated waters.....		186,543		187,353		216,793
EXPORTS—Mineral and aerated waters.....		12,402		47,597		16,780

NATRO-ALUNITE

CANADA

In the southwestern part of Kyuquot sound, which is one of the large fiords indenting the west coast of Vancouver island, the metamorphic volcanic rocks, which comprise the greater part of Vancouver island, have been peculiarly altered to rocks containing large amounts of alunite and pyrophyllite. These deposits of alunite and pyrophyllite, which are the only deposits of their kind known in Canada, were "staked" in 1908, and during the last few years the pyrophyllite rock has been quarried by the *British Columbia Pottery Company* as a "fireclay", and by the *San Juan Mining and Manufacturing Company* as a base of a powdered "household cleanser." Of later years alunite has attracted considerable attention as a possible source of "potash", as well as a source of alum. (*)

Production from this source amounted to 30 tons of calcined alunite in 1921. Small shipments were made during 1922, 1923 and 1925, but in 1926 there was no production. During 1927, a shipment of 7 tons of natro-alunite valued at \$248 was made. The preparation of natro-alunite for the market consists in crushing, grinding and roasting; the resultant product, calcined alunite, may be used as a fertilizer because of the potash content.

Table 422.—Production of Natro-Alunite in Canada, 1921-1927

Year	Tons	Value
		\$
1921.....	30	1,500
1922.....	50	2,500
1923.....	15	750
1924.....		
1925.....	20	1,000
1926.....		
1927.....	7	248
Total.....	122	5,998

PHOSPHATE

CANADA

The existence of the extensive Lievre river deposits of crystalline phosphate lime or apatite was first noted in 1829. However, the first commercial shipments of this mineral in Canada were made between 1870 and 1877 from North Burgess township, Ontario to a superphosphate plant at Brockville. An active market was open in Europe for raw phosphate for fertilizer purposes and this added impetus to the mining of phosphate in Ontario and Quebec. From 1878 to 1892 inclusive, the industry in Canada was at its highest point, and 296,695 tons were produced. Exports during this 15 year period totalled 281,329 tons of which quantity Great Britain received approximately 86 per cent; the United States, 8 per cent; Germany, 5 per cent; and France, Denmark, Spain and Holland, the remainder. The maximum shipment of 31,753 tons was made in 1890. Since 1899, however, the annual production has exceeded the 1,500 ton mark only once.

*Extract from report by Charles H. Clapp. Summary Report Geological Survey, 1913. P. 109.

The discovery and opening up in the United States of the large phosphate deposits in Florida in the nineties and later of those in Tennessee caused a sharp falling-off in prices for phosphate and resulted in the closing of the large Canadian mines.

The production of Canadian phosphate since 1895 has been mainly obtained as a by-product in the mining of mica.

Activity in the phosphate industry in Canada has been practically negligible for a number of years. In 1927 shipments of phosphate rock amounting to 151 tons valued at \$1,717 were made. The 1927 production consisted of 113 tons of crude phosphate obtained from old mine dumps in Ontario and Quebec, and 38 tons extracted for experimental purposes in British Columbia. During the preceding year 40 tons of crude material worth \$800 were shipped from an old mine dump.

The Canadian demand for phosphate is supplied almost entirely by shipments of Florida phosphate, and the total imports during 1927 were recorded at 17,485 tons, appraised at \$94,758. During the previous year imports amounted to 14,244 tons valued at \$65,607.

QUEBEC

The richest phosphate bodies discovered in the province were those in ranges XI and XII of the township of Buckingham and in the township of Portland West, west of the Lievre river. Scattered deposits of more than average richness were worked at various points in the Templeton district and towards the Gatineau river, but the total tonnage taken from these mines was not large. Although scattered mica deposits are found all through the country between and adjacent to the Lievre and Gatineau rivers for a considerable distance to the north of Ottawa, apatite as a vein mineral accompanying mica seems to become less abundant with increasing distance from the main bodies to the south, and in several of the most north-erly located mica mines it is almost entirely absent.*

The Lievre river deposits were first discovered in 1829, but records of the production of apatite in this district are only available since 1878. Shipments during 1886 amounted to 19,435 tons; the following year 19,589 tons were shipped by eleven mines, employing 456 men. During 1888, ten mines were operated, producing 20,396 tons and employing about 550 men; the next year reports were received from five producers employing 438 men and shipping 27,552 tons, the high record for the industry in this province. Since 1895, the annual production has never exceeded the 1,500 ton mark. Of recent years the production has consisted principally of minor tonnages obtained as a by-product in connection with the mining of mica.

ONTARIO

Between 1870 and 1877, the first commercial shipments of phosphate were made from deposits in North Burgess township to the Brockville Chemical and Superphosphate Company's plant for the manufacture of superphosphate. In 1870, the production from the two mines in North Burgess totalled 1,200 tons; 22 men were employed during that year. Only one property was active in 1871, employing 18 men and producing 200 tons. During 1887 five deposits were operated producing 4,101 tons and employing 130 men. The high mark for the industry was reached in 1890 when 15 producers reported total shipments of 4,581 tons. Since 1892 small shipments from Ontario deposits have been made intermittently.

*Extract from *Phosphate in Canada*, by H. S. Spence.

Table 423.—Production of Phosphate in Canada, by Provinces, 1870-1927

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1870.....			1,200	13,600	1,200	13,600
1871.....			200	2,100	200	2,100
1872-1877†.....						
1878*.....	9,919	195,831	824	12,278	10,743	208,109
1879*.....	6,604	101,470	1,842	20,565	8,446	122,035
1880*.....	11,673	175,664	1,387	14,422	13,060	190,086
1881*.....	9,497	182,338	2,471	36,117	11,968	218,456
1882*.....	16,585	302,019	568	6,338	17,153	308,357
1883*.....	19,666	427,168	50	500	19,716	427,668
1884*.....	20,946	415,350	763	8,890	21,709	424,240
1885*.....	28,535	490,331	434	5,962	28,969	496,293
1886.....	19,435	288,603	1,060	15,735	20,495	304,338
1887.....	19,589	264,452	4,101	55,363	23,690	319,815
1888.....	20,396	219,779	2,089	22,506	22,485	242,285
1889.....	27,552	287,400	3,436	29,262	30,988	316,662
1890.....	27,172	309,980	4,581	51,065	31,753	361,045
1891.....	20,244	206,416	3,344	35,187	23,588	241,603
1892.....	10,231	134,964	1,701	22,460	11,932	157,424
1893.....	7,650	60,076	240	1,886	7,890	61,962
1894.....	6,861	41,166			6,861	41,166
1895.....	1,822	9,565			1,822	9,565
1896.....	570	3,420			570	3,420
1897.....	908	3,984			908	3,984
1898.....	632	3,160	101	505	733	3,665
1899.....	1,279	7,674	1,721	10,326	3,000	18,000
1900.....	1,270	6,090	145	1,015	1,415	7,105
1901.....	1,033	6,280			1,033	6,280
1902.....	856	4,953			856	4,953
1903.....	1,329	8,214			1,329	8,214
1904.....	817	4,590			817	4,590
1905.....	1,300	8,425			1,300	8,425
1906.....	600	4,500	250	1,875	850	6,375
1907.....	408	3,410	416	2,608	824	6,018
1908.....	598	5,900	998	8,894	1,596	14,794
1909.....	525	4,800	473	3,254	998	8,054
1910.....	1,456	12,386	22	192	1,478	12,578
1911.....	586	4,909	35	297	621	5,206
1912.....	164	1,640			164	1,640
1913.....	385	3,643			385	3,643
1914.....	554	4,875	400	2,400	954	7,275
1915.....	200	2,400	17	102	217	2,502
1916.....	190	2,340	13	174	203	2,514
1917.....	123	1,230	26	256	149	1,486
1918.....	140	1,200			140	1,200
1919.....	22	300	2	31	24	331
1920.....						
1921.....	30	450			30	450
1922.....	131	1,320	59	476	190	1,796
1923.....	30	600			30	600
1924.....						
1925.....	16	189			16	189
1926.....	40	800			40	800
1927.....	31	399	82	824	111	1,171
Total.....	300,600	4,226,654	35,051	387,465	335,689	4,614,613

*Exports:—The Quebec figures include a quantity of Ontario phosphate cleared through Montreal.

†No record of production.

‡Includes 38 tons valued at \$494 shipped from British Columbia.

Table 424.—Production in Canada, Imports and Exports of Phosphate, 1925-1927.

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
PRODUCTION.....	16	\$ 189	40	\$ 800	151	\$ 1,717
IMPORTS—						
Phosphate rock.....	14,002	62,107	14,244	65,607	17,485	94,758
Acid phosphate (not medicinal).....	1,752	208,380	1,990	255,020	1,557	228,433
Phosphorus.....	34	36,414	44	38,135	44	34,618
Phosphor tin and bronze.....	279	238,002	325	267,493	343	253,893
Superphosphate or acid phosphate of lime.....	62,426	697,277	76,919	925,515	86,589	979,261
EXPORTS—Phosphate rock.....	25	500	40	800	.....	33

PYRITES

CANADA

Census returns for 1871 record a production of 2,800 tons of pyrites in Canada, made up of 2,300 tons from Quebec deposits and 500 tons from Ontario. However, it is only since 1886 that a continuous official record of pyrites production is available. Customs' records for the period 1881 to 1885 inclusive, show exports of 120,126 tons of pyrites to the United States. The 1886 output of pyrites was 42,906 tons, all of which was obtained from the Albert and Crown mines, Sherbrooke county, Quebec. In 1889, the production totalled 72,225 tons; shipments ranged from 27,687 tons to 158,566 tons during the following 24 years. The war years, 1914-1918, brought about an increased demand for sulphuric acid and a consequent advance in the production of pyrites. Shipments during this period reached a grand total of 1.6 millions tons or approximately 46 per cent of the total Canadian production from 1886 to 1927. Shipments of pyrites were made during 1927 by the Consolidated Copper and Sulphur Co. (formerly Eustis Mining Company) in Quebec, the Grasselli Chemical Company in Ontario, and the Consolidated Mining and Smelting Company in British Columbia. In addition the Britannia Mining and Smelting Company Limited shipped pyrite concentrate. The total production by these producers was reported at 50,863 tons worth \$198,388.

QUEBEC

The development of the pyrites industry in this province was due to the copper mining boom of 1859-1866. In 1863, the Capelton mines were opened up as gold prospects but as work progressed it was seen that there was available a considerable quantity of cupriferous pyrite. This property was taken over by an English concern about three years later and a plant was installed to treat the ore by the Henderson wet process. The failure to obtain satisfactory results by this process caused the closing down of the mines and they were not re-opened until 1879. From that date until their final closure in 1907 these mines were operated almost continuously. An extract from Bancroft's, *Copper Deposits of the Eastern Townships of Quebec* dealing with the development of this property from 1887 to 1907, follows:—

In 1887, while the Company was engaged in the erection of sulphuric acid works at Capelton, there was a decline in the output of the mines. It seems probable that in 1888, about 34,600 tons of ore were produced.

In 1889, the output was 36,000 tons. A small smelting plant was installed to treat the cinder from the chemical works as well as the richest of the copper ore. In 1889, also, works were constructed for the manufacture of chemical fertilizers and during the year 500 tons of Ottawa phosphates were used. The company was then employing about 300 men and treating about one-sixth of the output from the mines at its chemical works, while the remainder of the ore was shipped to various acid works in the United States.

In 1893 the No. 1 or Albert shaft had reached a depth of 2,100 feet on an incline that averaged about 30° toward the southeast; No. 3 shaft was 400 feet deep, and the No. 4 or Walter shaft was about 700 feet in depth. When one compares the data available concerning the production of the Eustis mine with the figures showing the total production of cupriferous pyrite in the province of Quebec, it is plain that after 1893, the annual output of the Capelton mines was very much reduced from what it had been in previous years. For a few months subsequent to August 17, 1893, work was suspended. In 1894, the decline in the price of copper caused the Eustis and the Capelton mines to reduce their staff by more than one-half. In Mr. Obalski's report for 1897, it is stated that about fifty men were employed underground, twenty on the surface and seventy in the chemical works. Mining operations ceased in 1907 because the supply of ore had been exhausted.

The Eustis mine was discovered about 1865, and shortly after in order to save the sulphur in the ore a small sulphuric acid works was started near St. John's, Quebec. Owing to the lack of a market for the acid the plant was abandoned. From 1872 to 1877 between 55,000 tons

and 65,000 tons of ore were taken from the mine. In 1877, a shipment of 1,388 tons of sulphur ore was made to London, Ontario. The Eustis plant was operated almost continuously to March, 1919, and after being closed down for four years was re-opened in 1923; operations have been carried on since that date.

In Ascot township, the Moulton Hill mine was discovered in 1887 and two years later this property was opened up by a large United States company. Shipments during 1889 totalled 2,000 tons of ore containing no copper. Operations ceased on this property in 1895.

The McDonald or Weedon mine in Weedon township was first operated in 1909. During the following year, 6,112 tons of cupriferous pyrite was shipped from this mine. An idea of the importance of the mine may be gained from an examination of the shipments from the Eastern townships of Quebec during the 1910-1914 period, the total being 330,029 tons, of which quantity the Weedon contributed 174,000 tons or 53 per cent. Mining ceased on this property in 1920 and it was kept in good order until October, 1922 when the pumps were removed and the mine consequently flooded.

A deposit of pyrites was located in Stratford township in 1910 and during 1914 a shipment of 1,600 tons of pyrite carrying 45 to 48 per cent sulphur and only a trace of copper was made to Hamilton, Ontario. Further shipments were made from this property during 1915 and 1916.

ONTARIO

Mining of pyrites commenced in Ontario during 1868 in Elizabethtown township, Leeds county. The following year 460 tons were shipped to the sulphuric acid plant at Brockville; in 1870 a further shipment of 150 tons was made. Operations on this property ceased in 1879.

The Bannockburn mine was opened up in 1898 and some shipments of iron ore were made to Hamilton, however, this ore, upon deeper working, proved to be the gossan capping of an iron pyrites deposit. These workings were abandoned in 1906; shipments during the six years of operation approximated 580 tons per month.

A small shipment of ore, running 40 per cent sulphur was made from the Sloan prospect in Elizabethtown township, near the old Billings mine.

The McIlwraith mine in Darling township was first opened up as a gold prospect but in September 1899 it was optioned by the Nichols Chemical Company and about 120 tons of ore were shipped. Upon the expiration of the option in April, 1900, all work ceased.

An account of the Hungerford mine is quoted from a report in 1907 by E. L. Fraleck of the Ontario Department of Mines:

The Hungerford mine (situated on Lot 23 in the twelfth concession of the township of Hungerford, Hastings county) was opened up 30 years ago as a gold property and a smelter was erected to extract gold from the barren pyrite.

The present operators, the American Madoc Mining Company (now Nichols Chemical Company) re-opened the mine in June 1903. Owing to some difficulty about the title, the mine was closed down in August, 1904, but operations were resumed in August 1905, and have since been continuous.

Prior to the erection of the acid plant at Sulphide in 1907, the ore from this property was shipped to Buffalo. In April, 1924, the mine was closed.

The Queensboro mine (Blakely) in Madoc township, Hastings county, shipped 65 carloads of 47 per cent sulphur ore prior to 1906. Operations ceased on this property in 1908.

Development work was commenced in 1906 on the Harris mine, located on the shore of James lake and some shipments of 42 per cent sulphur ore were made to Buffalo.

The Canadian Sulphur ore mine was discovered in 1906 and operations were carried on until 1921. P. E. Hopkins of the Ontario Bureau of Mines in 1916 gave the following information regarding this property:

The Canadian Sulphur Ore Company's pyrites mine was discovered in 1906 by Stephen Wellington while prospecting for iron. Under the gossan, merchantable iron pyrites was discovered, from which a car load of iron pyrites was shipped in 1908. Later, the Canadian Pyrites Syndicate bought the property, installed a small plant and shipped a few hundred tons of pyrite. In the spring of 1910 the property was handed over to the present company, which began shipping ore 3 months later, and has continued to the present. The mine is equipped to produce 100 tons of iron pyrites per day, yielding 40 per cent of sulphur. Since December 11, 1912, the mine has been run by electricity supplied by the Seymour Power Company.

A branch line $2\frac{1}{2}$ miles in length from the Bay of Quinte Railway near Queensboro to the mine was completed in 1913. The ore is shipped to the Nichols Chemical Company's acid plant at Sulphide, 11 miles southeast, and to the chemical companies at Hamilton and Detroit.

The ore is high grade, very little cobbling if any, having to be done. Ores have been shipped running 40 to 48 per cent sulphur.

The deposits are free from impurities such as arsenic, zinc, lead, copper and calcium. The pyrite burns satisfactorily, and is in good demand by sulphuric acid makers.

Work was commenced on the Caldwell mine in Blithfield township in 1916 and approximately 80 tons of ore were shipped during that year. Shipments have been made annually from this mine since 1919, although during the past six years the tonnages were obtained from stock.

The Helen iron mine, located about 15 miles northeast of Michipicoten harbour, has in the past produced large quantities of pyrites. The existence of pyrites in large quantity was only revealed by the underground work in 1904 and 1905. In 1910 this mine was the largest producer of pyrite in Ontario. Shipments continued until 1921 when the mine was closed down.

In 1910 the Vermilion (Northpines) pyrites mine on Lake Minnetakie was taken over by the General Chemical Company; no shipments were made during that year although considerable development work was done. During 1913 pyrites was exported to Buffalo, Chicago and Cleveland. Mining operations were continuous until 1921 but the following year there was no production. Tonnages were drawn from stock and shipped in 1923 and 1924 but since that date, only maintenance work has been done.

BRITISH COLUMBIA

Shipments of pyrites from the Sullivan mine at Kimberley to the sulphuric acid plant at Trail commenced in 1916 and continued annually to 1926. In 1917, the Hidden creek mine at Anyox shipped pyrites for the first time to the sulphuric acid plant at Barnet. With the exception of 1925 and 1927, tonnages of pyrites have been shipped annually from Anyox. Shipments of pyrite concentrate by the Britannia Mining and Smelting Company Limited commenced in 1927.

Table 425.—Production of Pyrites in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	42,906	193,077	1901.....	35,261	130,544	1916.....	309,251	1,084,095
1887.....	38,043	171,194	1902.....	35,616	138,939	1917.....	416,649	1,610,762
1888.....	63,479	285,656	1903.....	33,982	127,713	1918.....	411,616	1,705,219
1889.....	72,225	307,292	1904.....	37,180	134,033	1919.....	176,487	522,704
1890.....	48,227	123,067	1905.....	33,339	125,486	1920.....	174,744	719,110
1891.....	67,731	203,193	1906.....	42,743	169,990	1921.....	33,368	116,326
1892.....	59,770	179,310	1907.....	46,243	212,491	1922.....	18,143	74,303
1893.....	58,542	175,626	1908.....	47,336	224,824	1923.....	28,591	113,020
1894.....	40,527	121,581	1909.....	64,644	222,814	1924.....	23,552	95,620
1895.....	34,198	102,594	1910.....	53,870	187,062	1925.....	15,605	58,899
1896.....	33,715	101,155	1911.....	82,666	365,820	1926.....	17,845	63,899
1897.....	38,910	116,730	1912.....	81,526	314,081	1927.....	50,863	198,388
1898.....	32,218	128,872	1913.....	158,566	521,181			
1899.....	27,687	110,748	1914.....	228,314	744,508			
1900.....	40,031	155,164	1915.....	286,038	985,190			
						Total.....	3,643,247	13,442,280

Table 426.—Production in Canada, Imports and Exports of Pyrites, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	12,250	36,750	14,100	42,117	13,021	42,795
Ontario.....	685	8,799	371	4,912	463	6,077
British Columbia.....	2,670	13,350	3,374	16,870	37,379	149,516
Total.....	15,605	58,899	17,845	63,899	50,863	198,388
Sulphur content.....	7,587		8,975		25,229	
IMPORTS—						
Brimstone or sulphur, crude or in roll or flour.....	146,609	1,982,788	185,625	2,945,651	177,686	2,918,047
EXPORTS—						
Sulphur contained in pyrites.....	13	150			13,611	105,981

SULPHURIC ACID

CANADA

Statistics collected from 6 establishments manufacturing sulphuric acid in Canada during 1927 gave the production of the commodity in terms of the standard grades of 50° Bé, 60° Bé and 66° Bé. For comparative purposes it has been deemed advisable to reduce the first two grades to their equivalent in 66° Bé acid.

Importations of sulphuric acid into Canada during 1927 were comparatively negligible; exports at 17,407 tons were considerably lower than in the preceding year.

Table 427.—Production, Imports and Exports of Sulphuric Acid, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Sulphur used.....	26,202	359,519	22,844	417,479	19,805	386,557
Pyrites used.....	15,114	76,487	15,986	82,708	19,379	100,374
Acid made*.....	83,396	1,363,618	108,230	1,306,254	98,470	1,172,507
IMPORTS of acid.....	52	7,821	53	9,245	53	8,548
EXPORTS of acid.....	19,180	250,096	28,136	320,324	17,407	191,926

*Expressed in terms of 66° Bé acid. Includes also the production of the Mond Nickel Co. Ltd. at Coniston, Ont., who now produce sulphuric acid from waste smelter gases.

SILICA BRICK

CANADA

Silica brick is produced in Canada at Sydney, Nova Scotia, and Sault Ste. Marie, Ontario. The Nova Scotia raw material is obtained from a quarry located at Leitches Creek in Cape Breton County. In Ontario the quartz is extracted from a quarry in Deroche township, and is used in the production of refractory brick for the lining of iron blast furnaces.

During 1927, the total Canadian production amounted to 1,791 thousand valued at \$79,527 as against 2,665 thousand with a valuation of \$130,702 produced in 1926. The imports of silica brick during 1927 were valued at \$329,214.

SODIUM CARBONATE

CANADA

The commercial deposits of natural sodium carbonate now being worked in Canada occur on the line of the Pacific Great Eastern Railway in the Clinton mining district of British Columbia, in the vicinity of 70 Mile House. Small annual shipments have been recorded from the British Columbia deposits since 1921; the maximum production, 1,120 tons valued at \$8,140, being shipped in 1925. During 1927, shipments amounted to 805 tons valued at \$9,995 as compared with 595 tons worth \$5,370 shipped in 1926.

Sodium carbonate is used largely in chemical and hydro-metallurgical plants. Its principal uses are, in the manufacture of glass, soap and paper; the bleaching and washing of linen, cotton, wool, etc.; and the dyeing and printing of fabrics. Sodium carbonate has been utilized for some time as a means of removing, and of preventing the formation of boiler scale.

Soda ash from salt brine is made in Canada on a very large scale by Brunner-Mond Company, Limited, at Amherstburg, Ontario.

Table 428.—Production of Sodium Carbonate in Canada, 1921-1927

Year	Tons	Value
		\$
1921.....	197	14,775
1922.....	202	3,027
1923.....	265	3,975
1924.....	510	5,173
1925.....	1,120	8,140
1926.....	595	5,370
1927.....	805	9,995
Total.....	3,694	50,455

SODIUM SULPHATE

CANADA

Sodium sulphate is produced in Canada from natural deposits in Saskatchewan. Shipments from this source commenced in 1920 and 811 tons were produced during that year. There has been an annual production from these deposits since that date; in 1925 the total was 3,876 tons; in 1926 shipments amounted to 6,775 tons; and in 1927, a production of 5,659 tons was recorded.

Importations of salt cake during 1927 were 42,333 tons worth \$686,458; glauber's salt to a total of 288 tons at \$5,276 and bisulphate of soda or nitre cake amounting to 13,143 tons at \$50,698 were also imported into Canada.

Table 429.—Production of Sodium Sulphate in Canada, 1920-1927

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	811	19,496	1925.....	3,876	19,380
1921.....	623	18,850	1926.....	6,775	13,550
1922.....	504	11,980	1927.....	5,659	11,319
1923.....	733	10,189			
1924.....	1,083	6,004	Total.....	20,064	110,768

Table 430.—Production in Canada and Imports of Sodium Sulphate, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Natural Sodium Sulphate—						
Crude.....	3,876	19,380	6,775	13,550	5,659	11,319
Artificial Sodium Sulphate—						
Sodium sulphate.....	2,248	31,529	2,237	31,417	2,226	45,239
Glauber's salt.....	1,442	33,559	1,878	39,784	375	6,624
IMPORTS—						
Soda, bisulphate of, or nitre cake.....	21,873	72,939	15,948	53,536	13,143	50,698
Soda, sulphate of, crude, known as salt cake.....	34,215	471,931	41,945	644,696	42,333	686,458
Glauber's salt.....	518	8,177	733	10,069	288	5,276

CHAPTER TEN

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

Including Cement, Clay and Clay Products (Brick, Drain Tile, Kaolin, Sewer Pipe, Structural Tile, Stoneware and Pottery made from Domestic Clays, Fire Clay, Fire Brick, Fire Clay Blocks and Shapes, Imported-Clay Products), Lime, Sand and Gravel, Sand-Lime Brick, Slate, and Stone.

In twenty years, production in the clay products and other structural materials industries in Canada has increased more than three-fold; from a valuation of \$12,863,049 in 1907, the total for these industries rose to \$44,809,419 in 1927.

Cement production in Canada in 1887 amounted to 69,843 barrels worth \$81,909; in 1927, shipments were 10,065,865 barrels valued at \$14,391,937. The value of clay products produced increased from a total of \$1,126,057 in 1886 to \$11,173,189 in 1927. Lime shipments during 1886 were valued at \$283,755 or only 7.2 per cent of the grand total for lime of \$3,923,388 in 1927. In the stone industry a very substantial growth has also been recorded; data for 1886 place the value of stone production at \$723,593, while the 1927 total was \$9,265,304. Production records for sand and gravel date back no further than 1912; shipments at that time were valued at \$1,512,099 as compared with a total of \$6,055,601 in 1927.

Contracts awarded for building and construction in Canada in 1912 as reported by the *MacLean Building Review* were valued at \$463,083,000, which is still the high record mark for the building industry. In 1913 contract awards totalled \$384,157,000, and in the following year a decrease to \$241,952,000 was recorded. During the war period (1915-1918) construction work was largely neglected and the value of building awards remained below the 100-million-dollar mark during these years. A revival of building set in after the war, and in each year since 1920 the volume of building has been well above the 200-million-dollar mark. In 1927, the total value of building contracts awarded reached \$418,951,600, the highest on record since the banner construction year, 1912.

Costs of building materials in Canada as shown by the *Dominion Bureau of Statistics* index number of prices applying to 32 building and construction materials (base 100 in 1913) varied considerably from 1914 to 1924, inclusive. Yearly average for 1914 was low at 94; a further decline was registered in 1915 when the index number averaged only 90. An annual appreciation was apparent during the following five years until the maximum for the group of 215 was reached in 1920. The next year a falling off to 183 was recorded; followed by a further cost diminution to 162 in 1922, and a rise to 167 in the succeeding twelve months. During 1925 and 1926, building costs were very stable; in the latter year, the index number ranged from a maximum of 152.3 in January to 147.7 in December, with an average of 147 for the year. In 1927, the index numbers of prices showed very little variation during the year; ranging from 147.2 in February to a maximum of 148.3 in September and October; the year closed with the index at 147.8.

Table 431.—Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1925-1927

Province	1925	1926	1927
	\$	\$	\$
Prince Edward Island.....	8,495		
Nova Scotia.....	610,727	626,188	1,160,201
New Brunswick.....	298,763	383,233	475,365
Quebec.....	13,179,513	13,222,702	15,073,707
Ontario.....	17,089,582	17,650,738	19,662,038
Manitoba.....	1,767,050	2,608,110	2,373,075
Saskatchewan.....	184,757	359,409	574,304
Alberta.....	1,686,545	2,144,391	2,541,689
British Columbia.....	2,823,802	2,964,627	2,940,040
Canada.....	37,649,234	39,959,398	44,809,419

Table 432.—Production, Imports, Exports and Apparent Consumption of Clay Products and Other Structural Materials in Canada, 1925-1927

Item		Production	Imports	Exports	Apparent consumption
		\$	\$	\$	\$
Cement, portland.....	1925	14,046,704	63,067	1,498,495	12,611,276
	1926	13,013,283	96,679	358,231	12,751,731
	1927	14,391,937	105,420	308,144	14,189,213
Clay and clay products.....	1925	9,529,691	7,478,084	220,818	16,786,957
	1926	10,357,323	8,196,014	224,916	18,328,421
	1927	11,173,189	9,638,216	282,712	20,528,693
Lime.....	1925	3,387,652	47,639	312,168	3,123,123
	1926	3,781,484	42,855	344,616	3,479,723
	1927	3,923,388	70,075	367,939	3,625,524
Sand and gravel.....	1925	3,220,410	537,237	198,485	3,559,162
	1926	4,941,434	584,526	278,278	5,247,682
	1927	6,055,601	546,608	177,999	6,424,210
Slate.....	1925	.....	205,507	.....	205,507
	1926	.....	218,142	.....	218,142
	1927	.....	203,066	.....	203,066
Stone.....	1925	7,464,777	824,992	138,392	8,151,377
	1926	7,865,874	1,144,614	194,588	8,815,900
	1927	9,265,304	1,110,100	141,306	10,234,098
Total.....	1925	37,649,234	9,156,526	2,368,358	44,437,402
	1926	39,959,398	10,282,830	1,400,629	48,841,599
	1927	44,809,419	11,676,485	1,278,100	55,207,804

CEMENT

Natural rock cement is made by calcining at a moderate heat either an argillaceous limestone or a calcareous shale, which contains an excess of clay over the proportion required for Portland cement and generally a considerable quantity of magnesia. The calcination of these materials produces more or less incipient vitrification of the contained lime and clay.

Natural rock cement has been made and used for centuries. Its manufacture and proper manipulation seem to have been well understood by the Romans.¹

Portland cement is made by heating to nearly the fusing point an accurately proportioned and intimately blended artificial mixture of some material containing a high percentage of lime with another material containing silica and alumina in proper quantity and proportion. The lime is usually furnished by limestone or marl, and the silica and alumina by clay or shale. The necessary proportions of these three ingredients are fixed within comparatively narrow limits, and the composition of the mixture must therefore be constantly watched and chemically regulated. It is to this careful proportioning of the raw materials and the higher temperature of burning that Portland cement owes its great advantage over natural cement in uniformity and strength.²

CANADA

Although the first official record of the production of cement in Canada is that of the manufacture of hydraulic cement from the black limestones of Quebec in 1856, it is understood that lime and hydraulic cement were made at Hull between 1830 and 1840. The cement was manufactured from a grey argillaceous magnesian limestone obtained nearby. Plants were also operated at an early date at the mouth of the Magdalen river, Gaspé county, and in Argenteuil county, Quebec; in Ontario, at Kingston and Thorold.

It was not until 1887 that serious competition to the domestic production showed itself in large importations of Portland cement. In order to cope with this competition two Canadian manufacturers of natural cement changed their mills and processes. Canadian Portland cement made its appearance on the market in 1889. Two additional plants were constructed about this time; one at Shallow Lake, Ontario, and another at Longue Pointe, Quebec.

The period 1898 to 1905 was the scene of a boom in the construction and promotion of cement plants in Canada. Eleven marl plants were erected during these years, of which only three were really successful.

¹ Wells, J. W.: "Hydraulic Cements in Manitoba."

² Tagge, A. C.: "Cement Industry in Canada."

Prior to 1894, the cement requirements of British Columbia were supplied mainly by importations from England and the present Prairie provinces drew their supply from Ontario and the United States. In 1893, the Canadian Pacific Railway Company commenced the construction of a small plant at Vancouver in order to have available, at a reasonable cost, the necessary material for their replacement work. Four plants in all have been built in British Columbia, only one of which is being operated at present.

Two plants were built in Alberta during 1906 and 1907. This was the start of the cement industry in Alberta, and in the course of the past 20 years, four plants have been constructed, of which two were in operation during 1927.

The first mill to be erected in Manitoba was located at Arnold, 70 miles from Winnipeg; this was a natural cement plant. Another natural cement plant was started in 1906 at Babcock and in 1911 the first Portland cement plant was constructed in this province at Tuxedo. The Babcock and Tuxedo plants are still active.

Census returns for 1871 show that 6 cement plants were in operation. The capital invested in these plants totalled \$56,000; employees numbered 66 with a remuneration of \$25,300; and the value of products was \$51,300. Reports obtained ten years later record 9 active plants with a capital investment of \$57,400; a payroll of 128 men earning \$38,151; and products valued at \$91,658. In 1913, the 27 plants in operation produced 8,658,805 barrels valued at \$11,019,418 and employed 4,276 men whose earnings totalled \$3,466,451. During 1927, twelve plants were operated and 10,065,865 barrels were shipped, valued at \$14,391,937. Labour statistics showed maximum employment in September with 2,554 men working; March with 1,711 was the month showing the lowest average employment. The average number of wage-earners for the year was 2,145 in addition to whom there were 125 salaried employees on the rolls; combined earnings totalled \$3,143,932. Capital actually employed by the firms operating in this industry in 1927 was \$40,509,319. Fuel and electricity costs reached the sum of \$3,546,000, of which \$2,784,987 was expended for fuel and \$761,013 for electric power. Plant equipment included 1,145 electric motors with a total rating of 66,455 h.p.

In 1927 the average selling price of cement per barrel, f.o.b. plant, was as follows: Quebec, \$1.16; Ontario, \$1.37; Manitoba, \$2.50; Alberta, \$2.17; and British Columbia, \$2.26.

Portland cement to the amount of 19,354 barrels valued at \$87,541 was imported into Canada during 1927. The average value of the imported cement in 1927 was \$4.52 per barrel, while in the preceding year the average was \$3.68. Exports of cement were recorded at 249,694 barrels invoiced at \$308,144.

NOVA SCOTIA

Puzzolan cements differ from Portland and natural cements in so much as their constituents are only mixed and ground and are not burned. In Nova Scotia puzzolan cement was first produced from blast furnace slag and lime at Sydney in 1905. This plant was closed down in 1915, re-opened in 1920, but has been idle since 1921.

QUEBEC

Hydraulic cement was made at the Wright plant in Hull between 1830 and 1840. This cement sold at prices ranging between \$1.50 and \$2.50 per barrel of 300 pounds. Only natural cement was produced at this plant until the invasion of the Canadian market by imported Portland cement necessitated the changing of the processes in order to retain the local business. In 1889, the first Portland cement produced by this concern was placed on the market. Operations were carried on until the destruction of the plant by fire in 1900.

During 1888, a small plant was erected at Pointe Claire, near Montreal; a small quantity of Portland cement was produced but the operations were not successful and were discontinued. A plant was constructed in 1889 at Longue Pointe on the bank of the St. Lawrence river, east of Montreal and early the following year shipments of Portland cement commenced. The first dry process rotary kiln used in Canada was installed at this plant in 1899. Eight years later, the Vulcan Company purchased this property and built a new mill with most modern equipment. Operations at this plant also ceased in 1914.

The construction of the International plant at Hull was started in 1903 and within two years shipments were being made. This plant was enlarged in 1908 and the following year it became a unit in the large merger company. Owing to lack of market, because of the war, the plant was closed in 1914. Considerable work was done on the mill in 1925 and in June, 1926, operations recommenced.

A new plant was started in 1907 on the north side of the St. Lawrence river near the eastern limit of Montreal. Within two years the company was absorbed in the consolidation of thirteen plants in Canada. Very extensive alterations and additions were made to this plant, and it has been in continuous operation since 1909.

In August, 1925, the Unic plant was opened up at St. Francois de Sales, about 20 miles northeast of Montreal; operations ceased here in 1926.

The National plant at Montreal East commenced shipments in 1926.

The new modern mill of the National Cement Company at Montreal East is located about 12 miles from the center of the city of Montreal and a little over a mile from the St. Lawrence river. It is served by the Montreal Tramways, the Canadian National Railways and an improved highway, thus facilitating the local and outside shipments; moreover a rail connection to the St. Lawrence river makes the receipt of coal and gypsum, and the shipment by water, feasible. The plant, like that of the Canada Cement Company, one mile to the south-west, is located on the south-east edge of a ledge of limestone of the Trenton formation. The stone is quarried next to the plant and constitutes the raw material. This cement rock is of an ideal mixture in the deposit, requiring no addition of calcium carbonate, therefore the plant utilizes the dry process.¹

ONTARIO

Cement was produced at Napanee Mills (now Strathcona) in 1867. Clinker was made in kilns at this place and hauled by wagons to Napanee for grinding and packing. A new plant was constructed at Napanee Mills in 1891 for the production of Portland cement from marl and clay. Marl was transported 25 miles by rail from Marlbank and clay was obtained locally. Operations at this Strathcona mill commenced in December, 1891. During the same year a small Portland cement plant was erected at Marlbank which obtained its raw materials from Lime lake. The following year, the Marlbank plant was opened up and operated until 1898 when it was remodelled. In 1900 the Strathcona and Marlbank plants were taken over by a new company, and three years later the Marlbank mill was enlarged and improved, with the result that, in 1904, the Strathcona mill was closed permanently. Marlbank operations continued only until 1914 and since then the plant has been dismantled.

A company was incorporated in April, 1888, for the purpose of making Portland cement at Shallow lake, Ontario. At that time the rotary kiln was a new departure in the cement industry in England and one of these kilns was purchased and put into operation at the newly erected plant. After many vicissitudes, the company was re-organized in 1902; new equipment was obtained, and operations were made commercially successful. The plant was active until 1914 but it has since been dismantled.

The Hanover plant was built in 1898 to use marl and clay as raw materials. Marl was used at this plant until 1920 when it was replaced by limestone shipped by rail from Walkerton. In September, 1925, the mill was closed.

The Lakefield plant, another marl and clay proposition, was erected in 1901, and operated until 1914. This plant has been rebuilt.

Another mill was commenced in 1907 at Point Anne, near Belleville; shipments were started in the following year. Since that time the plant has been enlarged and operations have been carried on continuously.

Construction of a new plant at Port Colborne, near the lake Erie entrance to the Welland canal was started in 1907 and shipping commenced during 1908. In 1909, it became a unit of the merger company and was enlarged considerably; operations have been maintained since that date.

¹ Quebec Bureau of Mines Annual Report, 1926.

A departure from the dry process employed in the rock plants was instituted in 1912 when the St. Mary's mill was brought into operation using the wet process. This concern has been active during the past 14 years and is still a large producer.

Records for 1869 show two cement plants in Ontario, with an investment in plant and machinery of \$28,000, operating at Thorold and Napanee Mills and producing products valued at \$3,825. The following year these two plants employed 26 men and produced \$4,950 worth of products. In 1871 employment was furnished 28 men and the value of the mill output was \$11,700. The growth of the industry through the natural cement stage to the final concentration of the producers on the manufacture of Portland cement may be traced by the inception and subsequent disappearance of many companies. An idea of the magnitude of the industry can be obtained by a glance at the data for 1913 after consulting the figures for the earlier years, and then comparing these with the statistics for 1925 and 1927. In 1913 the 14 Ontario plants with a production of 3,992,998 barrels, employed 1,382 men earning \$955,729, and in 1925 the 4 plants operating produced 3,462,358 barrels at \$5,253,911, employed 749 men whose wages totalled \$1,018,915. Incidentally the capital actually employed in 1925 was \$12,513,281. During 1927 four plants were operated, their locations being Belleville, Port Colborne, Lakefield and St. Mary's. The production amounted to 3,751,786 barrels with a valuation of \$5,144,326.

MANITOBA

Cement production in this province started with the manufacture of the natural product. The first plant was built at Arnold but the operations here ceased years ago. Babcock, a few miles from Arnold, was the site for another mill which was constructed in 1906. This plant is still active. The construction of a plant at Tuxedo (Fort Whyte) 9 miles southwest of Winnipeg was started in 1911. For two years this plant used clinker produced near Belleville, Ontario. Since 1913 this mill has been using limestone obtained from a quarry at Steep Rock on the east shore of Lake Manitoba, 145 miles north of Winnipeg.

ALBERTA

Plants were erected at Calgary and Exshaw in 1906 and 1907. Raw materials for the former mill consisted of limestone hauled by rail from The Gap, some 60 miles west and shale from Sandstone, 20 miles south. The Exshaw mill, located 60 miles west of Calgary, uses limestone from a deposit close to the plant and shale which is transported by rail three miles from Kananaskis. In 1914 the Calgary mill was closed down and it has since been dismantled. A dry process plant was erected at Blairmore in 1909; it changed hands in 1919 but owing to insufficient demand for cement in the district, the plant has remained idle since that date.

A marl plant was built in 1912, at Marlboro about 140 miles west of Edmonton. Five years later a change was made to dry process, using limestone obtained from the mountains to the west, and local clay. Shipments have been made annually from this plant since 1917.

Work was commenced on a new plant at Medicine Hat in 1913 but the construction had not been completed before the outbreak of war in 1914 and the changed conditions caused the suspension of further work on this building.

BRITISH COLUMBIA

The Canadian Pacific Railway Company was the first to attempt to manufacture cement in British Columbia. About the year 1891 this company started the replacement, on a large scale, of the original wooden structures on the mountain section of its line, using in this work large quantities of masonry. The cement required was very costly, as it was all brought from England in sailing vessels which had to make the long, slow trip around Cape Horn. In an effort to reduce this cost the company decided to investigate the possibility of making cement at or near Vancouver, and for this purpose brought out from the Isle of Wight an experienced cement maker and chemist, who, after examining various materials available, made

a favourable report, and, in 1893, was commissioned to build a small plant on a site selected on the water front at Vancouver. Limestone was brought by barge from Texada island, about forty miles northwest of Vancouver, clay by rail from a cutting about thirty miles east, and coal by barge from the Dunsmuir mines on Vancouver island. The limestone was burned in simple kilns and then mixed with clay and water to form a slurry which was dried on a floor of iron plates with fires underneath. The dried slurry was burned in upright kilns and the clinker was ground by burr stones. The cement is said to have been of excellent quality and was used in thousands of yards of masonry which is still in good condition. This plant was in operation about ten years, after which it was dismantled.

In 1904, a rotary kiln plant was erected at Tod Inlet, Vancouver island, which by 1911 had increased in capacity until there were five kilns operating. Five years later the change in process from dry to wet was made. Operations were suspended at this mill in 1922.

A mill was erected at Bamberton, Vancouver island, in 1912; production commencing the following year. In 1916 this plant was closed down only to re-open in 1922. Production has been continuous since that date.

In 1912, another plant was built near Princeton but the company operating it went into liquidation in 1914 and the plant has since been dismantled.

Table 433.—Production of Cement in Canada, 1887-1927

Year	Barrels	Value	Year	Barrels	Value	Year	Barrels	Value
		\$			\$			\$
1887.....	69,843	81,909	1902.....	722,525	1,127,550	1917.....	4,768,488	7,724,246
1888.....	50,668	35,593	1903.....	719,993	1,225,247	1918.....	3,591,481	7,076,503
1889.....	90,474	69,790	1904.....	967,172	1,338,239	1919.....	4,985,257	9,802,433
1890.....	102,216	92,405	1905.....	1,360,732	1,924,014	1920.....	6,651,980	14,798,070
1891.....	93,479	108,561	1906.....	2,128,374	3,170,859	1921.....	5,752,885	14,195,143
1892.....	117,408	147,663	1907.....	2,441,868	3,781,371	1922.....	6,943,972	15,433,481
1893.....	158,597	194,015	1908.....	2,666,333	3,709,954	1923.....	7,543,589	15,064,661
1894.....	108,142	144,637	1909.....	4,067,709	5,345,802	1924.....	7,498,624	13,393,411
1895.....	128,294	173,675	1910.....	4,753,975	6,412,215	1925.....	8,116,597	14,046,704
1896.....	149,090	201,651	1911.....	5,692,915	7,644,937	1926.....	8,707,021	13,013,283
1897.....	205,213	275,273	1912.....	7,132,732	9,106,556	1927.....	10,055,865	14,391,937
1898.....	250,209	397,580	1913.....	8,658,805	11,019,418			
1899.....	396,753	633,291	1914.....	7,172,480	9,187,924			
1900.....	417,552	662,910	1915.....	5,681,032	6,977,024	Total.....	136,960,296	221,347,693
1901.....	450,394	660,030	1916.....	5,369,560	6,547,728			

Table 434.—Output, Sales, Imports, Exports and Consumption of Cement in Canada, 1925-1927

	1925		1926		1927	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
OUTPUT.....	7,869,946		9,041,411		9,927,163	
SOLD OR USED.....	8,116,597	14,046,704	8,707,021	13,013,283	10,035,865	14,391,947
STOCKS DEC. 31.....	1,274,923		1,609,313		1,470,611	
IMPORTS—						
Portland cement.....	21,849	63,067	21,114	77,866	19,354	87,541
Manufactures.....		13,753		18,813		17,879
EXPORTS.....	997,915	1,498,495	285,932	358,231	249,694	308,144
APPARENT CONSUMPTION.....	7,140,531		8,442,203		9,835,525	

Table 435.—Sales of Cement in Canada, by Provinces, 1925-1927

Province	1925		1926		1927	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
Quebec.....	3,365,802	5,689,991	3,727,377	4,535,386	4,636,751	5,383,058
Ontario.....	3,462,358	5,253,911	3,398,860	4,792,857	3,751,786	5,144,326
Manitoba.....	407,395	1,037,929	612,155	1,572,401	551,698	1,378,121
Alberta.....	395,857	913,529	423,766	873,621	601,699	1,303,880
British Columbia.....	485,185	1,151,344	544,863	1,239,018	523,931	1,182,552
Canada.....	8,116,597	14,046,704	8,707,021	13,013,283	10,065,865	14,391,937

Table 436.—Principal Statistics of the Cement Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	6	10	38,284,494	1,842	2,551,784	2,809,414	2,947,242	15,064,661
1924.....	6	10	36,786,574	1,837	2,531,622	2,872,711	1,524,158	13,398,411
1925.....	7	11	38,081,583	1,926	2,511,400	2,848,904	1,177,103	14,046,704
1926.....	7	12	41,380,000	2,340	3,052,662	3,424,156	(a)	13,013,283
1927.....	6	12	40,509,319	2,270	3,143,932	3,546,000	(a)	14,391,937

(a) Data not available.

Table 437.—Capital Employed in the Cement Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	35,368,100	34,495,477
Cost of supplies and stocks on hand.....	3,235,136	3,114,415
Cash, trading and operating accounts and bills receivable.....	2,776,764	2,899,427
Total.....	41,380,000	40,509,319

Table 438.—Employees, Salaries and Wages in the Cement Industry in Canada, 1926 and 1927

Class	1926		1927	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
SALARIED EMPLOYEES.....	124	272,770	125	270,328
WAGE-EARNERS.....	2,216	2,779,892	2,145	2,873,604
Total.....	2,340	3,052,662	2,270	3,143,932

Table 439.—Wage-Earners in the Cement Industry in Canada, by Months, 1926 and 1927

Month	1926	1927	Month	1926	1927
January.....	1,723	1,735	July.....	2,417	2,545
February.....	1,886	1,748	August.....	2,377	2,548
March.....	1,979	1,711	September.....	2,287	2,554
April.....	2,178	1,854	October.....	2,149	2,128
May.....	2,483	2,143	November.....	2,136	2,160
June.....	2,478	2,319	December.....	1,996	2,087

Table 440.—Fuel and Electricity Used in the Cement Industry in Canada, 1926 and 1927

Kind	Unit of Measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	441	2,016	—	—
Bituminous coal—Canadian.....	Ton	504,577	2,664,760	248,161	1,350,933
Bituminous coal—Imported.....	Ton			250,182	1,385,395
Lignite coal—Canadian.....	Ton			14,528	46,487
Coke.....	Ton	49	548	69	661
Fuel oil.....	Imp. gal.	225	54		
Gas.....	M cu. ft.	9,274	5,564		
Gasoline.....	Imp. gal.	8,559	2,220	5,592	1,140
Kerosene or coal oil.....	Imp. gal.			1,752	371
Electricity purchased*.....	K.W.H.	169,280,187	748,994	180,083,257	761,013
Total.....			3,424,156		3,546,000
Electricity* generated for own use.....	K.W.H.			256,300	

*In 1926, the record shows only total electricity used.

Table 441.—Power Employed in the Cement Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturer's rating	Number of units	Total h.p. according to manufacturer's rating
Steam engines and turbines.....	5	418	3	158
Gasoline, gas and oil engines.....	11	283	9	273
Hydraulic turbines or water wheels.....	—	—	—	—
Total primary power.....	16	701	12	431
Electric motors run by purchased power.....	1,122	65,800	1,101	64,555
Total power employed.....	1,138	66,501	1,113	64,986
Electric motors run by primary power in same plant.....	44	1,900	44	1,900
Total electric motors.....	1,166	67,700	1,145	66,455
Boilers.....	8	2,302	13	2,368

CLAY AND CLAY PRODUCTS

CANADA

Under "Clay and Clay Products" there have been included statistics relating to production in Canada from domestic clays, of (a) fire clay; (b) fire clay blocks and shapes; (c) fire brick; (d) brick made by the different processes, such as the soft mud process, stiff mud process and dry press; (e) structural tile, such as hollow blocks, roofing tile, floor tile (quarries), and ceramic or glazed floor and wall tile; (f) drain tile; (g) sewer pipe, including copings, flue linings, etc.; and (h) pottery.

The clay products industry has been carried on in Canada for many years; census records for 1871 show 426 brick and tile producers in Canada employing 3,073 workers whose wages totalled \$399,698. The value of products made in that year was \$925,235. Corresponding with

the growth of the country, ten years later the number of plants in operation had risen to 560, with a payroll of 4,129 employees, wages amounting to \$608,690, and a production value of \$1,541,892. Statistics for 1886, record 261 brick and 82 tile plants in operation with a total output valued at \$1,016,217. Building brick (common and pressed) was produced in increasing quantities from the beginning of the century; 1900 recorded a valuation of \$2,275,000 while in 1906, the sum of \$4,102,590 was realized from the sale of these products. Almost similar conditions applied to the activities of the plants producing other clay products.

In 1920, the 223 operators reported sales aggregating in value to \$10,664,929; wage-earners numbered 5,212 and the outlay for wages was \$5,053,837. In 1927, sales showed an increase of 8 per cent over the total of \$10,357,323 reported in 1926. Ontario's production in 1927 was valued at \$5,853,035 or 52.4 per cent of the total for Canada; Quebec sales totalled \$2,734,738; Alberta sales, \$889,358; British Columbia, Nova Scotia, Saskatchewan, Manitoba and New Brunswick followed in the order named.

Capital employed in the 194 plants in operation during 1927 was \$30,437,607. Salaries and wages paid to the 4,776 employees amounted to \$4,769,307. Fuel and electricity consumed accounted for an outlay of \$2,088,724. Primary power employed totalled 135 units with a manufacturers' rating of 8,897 h.p., in addition to which there were 419 electric motors in operation rated at 15,617 h.p.

Importations into Canada of clay, clay products and similar materials reached a high mark in 1927 when the value was recorded at \$9,638,216. The principal items of the import group were earthenware and chinaware and fire brick, which made up almost 72 per cent of the total in 1927.

Brick.—Common and pressed brick produced in Canada during 1886 had a value of \$873,600: the plants in operation were located in Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, North West Territories and British Columbia. Progress in the brick industry was recorded during the succeeding twenty years and in 1906 the value of common and pressed brick produced reached a total of \$4,102,590. In the following year, data were obtained segregating the production of these two classes of brick: 439,016,000 common brick valued at \$3,455,524 and 78,922,000 pressed brick worth \$794,722 were shipped during 1907.

Common brick production reached its highest point in 1912 when 769,192,000 at an average value of \$9.11 per thousand, were shipped. During the same year pressed brick production established a record at 125,180,000 with an average value of \$12.86 per thousand. Since 1917, the value per thousand has never fallen as low as the average price in 1912.

In 1924 a new schedule for the collection of clay products statistics was designed as the result of a conference of the *Dominion Bureau of Statistics* officials with the members of the *Canadian National Clay Products Association*. This new form subdivides the information regarding the production of brick according to the different processes. Hereafter data are recorded under the separate headings; face and common—soft mud, stiff mud and dry press processes.

The production of building brick during 1927 amounted to 398,439,000 valued at \$6,941,131 as compared with 358,348,000 worth \$6,525,565 shipped in 1926.

Paving brick production in Canada was first recorded in 1897 when 4,568,000 were shipped by plants at Toronto, Ontario. During the period 1899-1907, the average annual production was 3,917,000. Prior to 1914 the total Canadian output of paving brick came from West Toronto, Ontario, where shale from the banks of the Humber river was used. In 1914, 1915 and 1916 the Clayburn plant in British Columbia produced a small quantity. In 1916 a plant at Edmonton, Alberta, produced a minor quantity of paving brick. During the succeeding five years there was no production, but, in 1922, the Clayburn plant shipped 151,000. Production ceased until 1926, when the British Columbia plant made shipments of 122,000 paving brick. In 1927, shipments of 50,000 paving brick were made.

Drain Tile.—Data regarding the production of drain tile in Canada are available since 1891. From information obtained by the *Ontario Department of Mines*, production during that year was valued at \$90,000. Ten years later production had increased until a valuation of

\$250,000 was reached. A record was set up for the output of drain tile in 1919 when the valuation attained a total of \$616,510. During 1927, drain tile shipments totalled 22,259,000 averaging \$26.87 per thousand.

Kaolin.—Deposits of kaolin at St. Remi d'Amherst were first noted by the Geological Survey in 1894. Two years later samples were shipped to porcelain plants at Trenton, New Jersey, but, it was not until 1911 that any serious attempt was made to develop this property. Production commenced in 1912, when 20 tons were shipped. Increases were recorded annually until the maximum production of 1,750 tons for the industry was reached in 1916. Shipments continued up to 1923, in which year, 163 tons were sold. No commercial shipments of kaolin have been made from Canadian deposits since 1923. During 1927, a small shipment was made from the St. Remi d'Amherst deposit for testing purposes.

Some development work was done during 1925 and 1926 on the china clay deposits on the Mattagami river, near Long Falls, Temiskaming district, Ontario.

Sewer Pipe.—Records of sewer pipe production in Canada date back to 1888 when shipments of this commodity were valued at \$266,320. Production during the succeeding years varied considerably until in 1907 a valuation of \$667,100 was recorded. Seven years later, 1914, the sewer pipe production was valued at \$1,104,499. In 1922, the high mark for the industry was reached, when sewer pipe to a value of \$1,766,347 was shipped from Nova Scotia, Quebec, Ontario, Alberta and British Columbia plants. The total capital employed in these plants was \$3,057,149 and employment was afforded 448 persons who received \$547,411 in salaries and wages. Sewer pipe, copings and flue linings shipped in 1927 amounted to 77,262 tons valued at \$1,475,875. Five plants were active during the year with a capital investment of \$3,246,183 and a payroll of 421 men earning \$506,730.

Structural Tile.—Records of the production of structural tile in Canada include such items as hollow blocks (fireproofing and load-bearing tile), roofing tile, and floor tile. Hollow blocks are produced in every province except Prince Edward Island and New Brunswick. Roofing and floor tile are made in Ontario. The total production of structural tile in Canada during 1927 was valued at \$1,463,840 as compared with a value of \$1,360,066 in the previous year and \$1,128,058 in 1925.

Stoneware and Pottery from Domestic Clays.—Records for 1888 show shipments of pottery from Canadian plants valued at \$27,750; within the next four years the production had increased to nearly ten times that value. Production thereafter varied but remained above the \$100,000 mark each year up to the end of 1911. From 1912 to 1916, values ranged between \$35,371 and \$64,900. During the following years a considerable improvement was shown in annual sales and in 1926 a record valuation of \$320,135 was set up. During 1927, shipments of pottery were valued at \$307,057.

Five plants with total assets of \$359,918, were engaged primarily in the production of stoneware and pottery from Canadian clays in 1927. Employees in the industry totalled 152 persons whose earnings were \$150,965.

In New Brunswick, a plant at Saint John produces stoneware, Rockingham ware and flower pots from Canadian clay. Flower pots are produced from local clays at Toronto and Hamilton, Ontario. Rockingham ware and flower pots are produced at Medicine Hat, Alberta.

Fire Clay.—Clays from the Drummond colliery at Westville, Nova Scotia, and from Flower Cove, New Brunswick, are used for the manufacture of refractory products.

In Quebec, the discoloured portions of the kaolin found at St. Remi d'Amherst can be utilized as a fire clay.

In the valleys of the Abitibi, Mattagami and Missinaibi rivers, which flow northward on the James bay slope, in Ontario, the occurrence of residual deposits of refractory clays has been known for many years. The extension of the Temiskaming and Northern Ontario railway from Cochrane to Oil Can Portage on the Abitibi river has brought an important deposit within 30 miles of shipping facilities.

In Manitoba, semi-refractory shale is found in Turtle Mountain, at La Riviere and near Virden in the Assiniboine valley.

Refractory and semi-refractory clays occur in southern Saskatchewan. At Claybank, in the Dirt hills, south of Moose Jaw, standard fire brick, special shapes and face brick are made from local clays. Similar clays are found near Michellton at Willows, south of Twelve Mile lake and along the Frenchman river valley in the Cypress hills.

Along the Athabaska river near Fort McMurray, refractory and semi-refractory clays are found associated with the tar sands.

A very important deposit of fire clay occurs in Sumas mountain, about 40 miles eastward from Vancouver, British Columbia; at Clayburn, refractory products are made from this clay. Refractory shales also occur near Whonnock and a residual fire clay deposit at Kyuquot, Vancouver island, is operated; the clay is shipped to Victoria for the manufacture of stove linings and sewer pipe.

In 1889, the first production of fire clay in Canada was recorded, namely, 400 tons valued at \$4,800. The maximum production for the industry, in point of tonnage, was reached in 1917 when 10,534 tons were shipped. During 1927, total shipments from Nova Scotia, New Brunswick, Saskatchewan and British Columbia amounted to 5,070 tons valued at \$35,961. Imports of fire clay into Canada in 1927 totalled 49,226 tons evaluated at \$219,500.

Fire Brick.—Fire brick production in Canada from domestic clays reached its highest point in 1917 when 8,192,000 were produced with an average selling value of \$24.31 per thousand. Although sales have been smaller during the following years, higher prices prevailed and thus the 1917 aggregate valuation has been exceeded annually. During 1927, Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia plants shipped 5,388,000 fire brick valued at \$246,266.

Fire Clay Blocks and Shapes.—Plants in Nova Scotia, Saskatchewan, and British Columbia produce special fire clay blocks and shapes from domestic clays. In 1907 the output of this class of refractory products was valued at \$18,000. Production increased until in 1918 a record for the industry was set up when shipments to a value of \$111,589 were made. The 1927 production had a sales value of \$100,659.

Three plants in Canada, located at Montreal, St. Johns, and Toronto, produce special refractory blocks and shapes from imported clays. In 1927, these plants shipped special refractory products worth \$331,000.

PRINCE EDWARD ISLAND

Red clay found at Richmond is exceptionally plastic, excellent for wheel work, built pottery, or for casting; it burns to a hard body of fine red colour that takes glazes well.

In 1886 eight brick plants and one tile plant operating in this province, shipped products valued at \$13,120. In the following year, production declined to \$9,145 as only 6 brick plants were active. A further decline was recorded in 1888 when the 4 active plants shipped products worth \$9,900.

In recent years, only one plant has been in operation in this province and the annual production has been small.

NOVA SCOTIA

Deposits of brick clays that can be used on the potters' wheels as they come from the bank are located at Avonport, Middleton, Bridgetown, Annapolis, Shubenacadie and Elmsdale. Stoneware clays are found at Middle Musquodoboit and Shubenacadie.

Records for 1871 show 39 brick and tile plants in operation in Nova Scotia. Wages paid in these plants in that year amounted to \$18,481 and the value of products totalled \$34,138. Ten years later 41 plants were active; wages paid increased to \$26,790 and production value advanced to \$64,775. In 1920, the value of clay products shipped by Nova Scotia operators was \$541,114; the maximum production for this province. Common and pressed brick, hollow building blocks, refractories, sewer pipe, and drain tile comprised that year's production.

Eleven clay products plants with a capital investment of \$1,788,529, were operated in 1921. There were 231 employees on the pay-rolls during the year and these were paid \$164,709. During 1927 ten plants were active with a production valued at \$416,417; employment was furnished to 206 persons whose earnings totalled \$169,300.

NEW BRUNSWICK

In New Brunswick, red brick clays suitable for the manufacture of coloured earthenware, without much preparation, are found near Saint John, Albert Mines and Bathurst. The coal measures of the Grand Lake district furnish certain clay beds suitable for stoneware, pottery and saggars.

Nine brick and tile plants were operated in New Brunswick in 1871 and products shipped were valued at \$19,960. Wages paid to the 85 men employed totalled \$9,193. According to statistics for 1881 the New Brunswick production from the 14 active plants was worth \$43,650; there were 188 men employed in these plants to whom wages totalling \$19,161 were paid. Production since 1904, has not varied greatly, and in 1927 the value of common brick, fire brick, fire clay and pottery shipped was \$87,185.

In 1921 four brick and tile plants and one stoneware and pottery plant were active; a total capital employment in these plants of \$106,299 was recorded. Salaried officers and wage-earners employed during the year numbered 70 who received \$40,961, while products sold were valued at \$66,600. Capital invested in the 3 plants in operation during 1927 was \$129,002; employees numbered 59; and salaries and wages, \$41,995.

QUEBEC

Clays of Pleistocene age are found abundantly in the St. Lawrence and St. John valleys and in the clay belt of northern Quebec. The clays in the St. Lawrence valley are very uniform in composition and burn to a red colour. These clays enter into the manufacture of cement, brick, drain tile, structural tile and sewer pipe. Vitrified sewer pipe is made at St. John's by mixing these local clays with imported New Jersey fire clay. At Laprairie, Utica-Lorraine shales are used by the largest producer in the province. A deposit of varied stratified clay at L'Islet station supplies raw material for the manufacture of brick and tile. Brick plants at Deschailions obtain their raw material locally from a large bed of stratified clay.

Kaolin or china clay is found at St. Remi d'Amherst, about 70 miles northwest of Montreal. This deposit was not operated commercially until 1912, and four years later the maximum production of 1,750 tons was shipped. Washed kaolin for use as a paper filler and quartz sand have been shipped from this property. The deposit was not operated during 1924, 1925 and 1926, but in 1927 a small test shipment was made.

The clay products industry in Quebec has shown a very substantial growth since its inception. Records for 1871 refer to the operation of 69 brick and tile plants in this province. These plants shipped products valued at \$293,233 and employed 791 persons to whom \$142,182 were paid in wages. A glance at the next decennial census figures reveals 78 active plants, producing brick and tile with a selling value of \$387,924. In 1891 production rose to a value of \$500,957. The valuation of \$1,680,460 was reached in 1912 and it was not exceeded until 1920, when the plants in this industry shipped products worth \$2,376,029. A recession was noted in the following year; but, during the period 1923-1926 the annual production value was approximately 2.4 million dollars. The high mark for the industry was reached in 1927 when shipments had an aggregate value of \$2,734,738. Capital employed in the 20 plants operating was \$10,771,722 and employees totalled 1,079, who received \$1,068,418 in salaries and wages.

ONTARIO

Ontario clay deposits are classed broadly as follows: (1) Residual, i.e., being found where they were formed, as from weathering of feldspar, which includes all white-burning clays and also a few red-burning clays. (2) Transported, which includes practically all the clays in Ontario, as formed by the agencies of wind, water or glaciers,—the last two being of greatest importance.

Transported clays are again classed as of (a) Marine derivation, i.e., shales and fire clays; (b) Lacustrine deposits laid down in lakes, giving the same general types as in the marine clays; (c) Flood plains as in Mississippi valley but rare in Ontario; (d) Deltas; and (e) Glacial clays. The last mentioned class of deposit is particularly important in this province. Examples of interglacial clays may be seen in the Don Valley deposit at Toronto, where brick of a wide range of colours is produced from clays and underlying shales.

Deposits of clay suitable for the manufacture of brick, tile, sewer pipe and flower pots are widely distributed throughout Ontario. The greatest development of these deposits is in and surrounding the densely populated areas: Toronto and Hamilton and their environs being the principal centres of activity, although in 1927 plants were in operation in practically every county in the southwestern peninsula. In recent years, the use of shale in the making of brick has been extensive, principally in plants at Toronto, Cooksville, Streetsville and Milton. Drain tile, hollow building tile, floor and roofing tile are also produced in Ontario. Domestic clays are used at Hamilton and Toronto for the production of flower pots. Three plants located at Hamilton, Mimico and Swansea produce sewer pipe from a special clay obtained at Aldershot, near Hamilton.

Census data for 1871 show 309 brick and tile plants in operation in Ontario; these plants employed 1,939 persons, whose earnings totalled \$229,842 and the value of the year's production was \$577,904. Returns for the next decennial census showed 400 active plants with an output valued at \$971,158. Employment was furnished during that year to 2,768 workers who received \$405,311. During 1886, there were 188 brick producers whose sales totalled \$631,892, and 74 tile producers who shipped commodities worth \$139,307. Production of clay products during the period 1906-1914 inclusive ranged between 2.4 million dollars and 5.2 million dollars; however, the war period recorded a falling-off to an annual average of 2.3 million dollars. The peak for this industry in point of production value was reached in 1922 when sales amounted to \$6,944,218. Active plants during that year numbered 155, with a total capital investment of \$14,363,332, and a payroll of \$2,808,597 earned by 2,656 employees.

Operations were carried on in 131 plants in Ontario during 1927; shipments from these plants had an aggregate value of \$5,853,035. Capital actually employed by the active firms was \$14,051,320 or 46 per cent of the total investment in this industry in Canada. The number of employees engaged in the production of clay products in Ontario was 2,504 to whom a total remuneration of \$2,528,604 was paid.

MANITOBA

Surface clays and the older shales and clays provide raw material for the manufacture of brick and tile in Manitoba. Only the former clays are used by the plants operating at the present time. During the period 1908-1912 shale was used in the manufacture of pressed brick, hollow tile and sewer pipe.

Prior to 1913, Manitoba's output consisted principally of common soft mud brick and the demand for face brick was supplied by importations. The contrary has been the case since that time as the manufacture of face brick became an important branch of the industry in the province. At Winnipeg the Alsip plant produces stiff mud face brick and at Sidney there is a plant equipped to produce face brick and building tile. Structural tile and drain tile are produced at the stiff mud process plants in Manitoba.

During 1886, four brick plants were operated in Manitoba and shipped products valued at \$14,475. The high mark for the industry was reached in 1912, when 21 active plants made shipments of brick (common and pressed) and drain tile worth \$1,018,051. Employment was furnished during that year to 1,088 men in this industry whose earnings totalled \$405,926. In 1927, the capital invested in the 4 operating plants was \$217,459. Wages paid to the 104 persons on the pay-rolls amounted to \$110,886, and the value of the clay products shipped during the year was \$201,464.

SASKATCHEWAN

White and grey clays varying from low grade stoneware clays to fire clays are found in the southern part of Saskatchewan. Clay for the manufacture of pottery and sewer pipe is shipped from deposits at East End and Willows to Medicine Hat, Alberta. A plant at Claybank, south of Moose Jaw uses fire clay obtained from local deposits for the manufacture of refractory products. At Bruno, Saskatoon and Prince Albert, plants produce face, common and hollow building brick from local clays.

During the banner construction year, 1912, common and pressed brick shipped amounted to 30,539,000 valued at \$332,943. There were 14 plants active in 1912; the average number of men employed was 383 and the total wages \$152,654.

The 1927 production was valued at \$311,204 and was made up of shipments from 6 plants, employing 154 men who received \$127,297 in wages.

ALBERTA

Natural gas is used extensively in the plants located at Medicine Hat and Redcliff; the Medalta Potteries Ltd. and the Alberta Clay Products Co. at Medicine Hat use this fuel. Near Redcliff the clays are obtained by mining and are very difficult to dry and burn, but the advantage of having cheap fuel at hand enables the operators to produce brick at reasonable costs. Building brick (face and common, stiff mud process and dry press) is produced at Cannell, Riverdale and Redcliff. Hollow building block, drain tile, sewer pipe and certain refractory products are manufactured at Medicine Hat.

Alberta in common with other western provinces set up a high record for the production of clay products in 1912; the value of building brick, fireproofing brick and blocks, and drain tile shipped was \$1,356,184.

In 1920, the 11 Alberta plants operating employed 428 men who earned \$496,669 and the total production was valued at \$786,430 or 7.37 per cent of the Dominion total for this group. The following year 414 employees were on the payrolls and their earnings amounted to \$427,124 while the value of products sold was \$710,477. During 1921 the capital actually employed in the operation of these clay products plants reached a total of \$2,268,645. Production during the succeeding four years declined considerably, but in 1926 a renewal of building activity resulted in an advance to a value of \$804,933. In 1927, the value of production was \$889,358; the capital investment \$2,279,425; employment was furnished 352 persons whose earnings were \$382,199.

BRITISH COLUMBIA

Five brick plants were in operation in British Columbia during 1886 producing brick with a total valuation of \$41,150. The expansion of the clay products industry in this province may be seen upon an examination of statistics for 1912, a record year when plants were operated at Vancouver, New Westminster, Clayburn, Cloverdale, Bazan bay, Pender island, Port Haney, Anvil island, Victoria and Sydney. In all, 28 plants were active during the year shipping products worth \$996,568 and employing 814 men who received wages totalling \$492,916. Building brick, paving brick, fire brick, fireproofing brick and blocks, sewer pipe and drain tile were produced. In 1920 British Columbia contributed 5.59 per cent of the total Canadian production of clay products; shipments were valued at \$596,172. Nine plants were active during that year; their capital investment amounted to \$885,903, and their pay-rolls showed 247 men employed at a total remuneration of \$303,160. A falling-off in production was recorded during the ensuing four years but in 1926 sales rose to a total valuation of \$592,495. During 1927, there were 10 plants in operation with an aggregate capital actually employed of \$1,188,309 and employees numbering 318 were paid \$340,608.

A shipment of 30 tons of bentonite valued at \$150 was made in 1926 from Princeton. During the same year development work was done near Williams lake on a deposit of a refractory material known locally as kaolin but described merely as "silicate of alumina" by the Provincial Mineralogist; 129 tons valued at \$1,900 were produced. This material was shipped to Vancouver where some was used in the manufacture of plastic firebrick and refractory cements, and some directly as fire clay.

In this section all tables except Table 444 show data for domestic clay products only.

Table 442.—Production of Clay Products in Canada from Domestic Clays by Provinces, 1886-1927

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Canada
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1886.....	13,120	50,630	33,218	83,025	881,039	14,475	9,400		41,150	1,126,060
1887.....	9,145	43,746	46,541	80,117	1,187,453	8,125	4,300		19,480	1,398,907
1888.....	9,900	56,995	34,364	223,161	1,123,671	2,400	1,650		42,532	1,494,673
1889.....	6,504		93,425	278,845	1,182,397	19,636	9,210		62,317	1,652,334
1890.....	11,775	60,520	70,430	458,597	1,347,278	15,300	10,000		67,201	2,041,101
1891.....	8,220	54,755	47,071	500,957	1,076,154	13,300	23,000		79,475	1,802,932
1892.....	6,536	93,611	52,853	489,470	1,313,877	67,450	24,937		129,234	2,177,968
1893*.....										2,619,590
1894*.....										2,560,236
1895*.....										2,487,248
1896*.....										2,227,962
1897*.....										2,325,903
1898.....	†	173,280	113,400	820,758	1,449,536	34,000			100,000	2,690,974
1899.....	†	110,695	85,600	828,868	1,828,936	25,000			109,000	2,988,099
1900.....	†	108,210	80,920	866,060	2,009,915	25,000			105,000	3,195,105
1901.....	†	103,695	50,229	884,166	2,222,620	20,000			101,996	3,382,706
1902.....	†	152,025	150,945	946,755	2,149,451		150,000		76,313	3,625,489
1903.....	†	150,100	150,675	1,028,246	2,402,520		150,000		152,748	4,034,289
1904.....	†	157,762	150,830	917,894	2,306,200		150,000		158,874	3,841,560
1905.....	†	90,146	45,010	896,000	2,696,500	588,735	103,278	191,287	98,886	4,709,842
1906.....		160,506	49,220	769,458	3,136,870	517,065	136,022	180,217	123,277	5,072,635
1907.....		125,560	57,377	1,214,108	3,123,372	466,432	125,459	353,672	306,137	5,772,117
1908.....		117,833	75,513	893,717	2,476,152	265,091	87,566	240,384	344,446	4,500,702
1909.....		188,185	65,570	1,153,832	3,425,841	559,008	145,516	442,486	470,402	6,450,840
1910.....		204,782	56,475	1,442,842	3,667,810	781,605	160,850	753,232	562,360	7,629,956
1911.....		274,249	38,000	1,341,467	3,916,575	834,428	226,958	1,052,751	675,505	8,359,933
1912.....		272,053	54,910	1,680,460	4,864,700	1,018,051	332,943	1,356,184	996,568	10,575,869
1913.....		332,272	62,269	1,606,816	5,220,467	514,358	189,820	893,408	684,904	9,504,314
1914.....		266,204	66,502	1,267,700	3,979,606	317,488	98,349	462,199	413,909	6,871,957
1915.....		221,881	35,780	918,425	2,254,863	93,674	44,406	115,696	229,763	3,914,488
1916.....		238,470	42,881	993,664	2,145,036	104,248	78,668	225,140	292,698	4,120,805
1917.....		331,542	51,304	983,310	2,575,304	114,651	78,251	309,991	334,685	4,779,038
1918.....		303,515	39,055	817,357	2,434,215	116,417	133,935	381,074	357,921	4,583,489
1919.....		432,900	52,941	1,577,576	4,574,796	131,737	270,989	571,949	293,478	7,906,366
1920.....		541,114	73,484	2,376,029	5,613,488	206,764	471,448	786,430	596,172	10,664,929
1921.....		361,761	66,600	1,744,760	5,183,125	208,982	166,244	710,477	415,869	8,857,818
1922.....		427,643	75,425	2,494,236	6,944,218	210,740	134,704	700,063	447,452	11,438,456
1923.....		413,974	62,587	2,439,598	6,270,615	160,134	119,405	590,565	426,138	10,483,016
1924.....		3,340	355,948	74,994	2,435,695	5,089,299	117,450	137,280	540,477	460,594
1925.....		3,020	422,690	69,473	2,426,887	5,195,084	173,794	95,952	618,860	9,215,077
1926.....		362,667	75,851	2,702,298	5,356,469	248,497	214,113	804,933	523,931	10,357,323
1927.....		416,417	87,185	2,734,738	5,853,035	201,464	311,204	889,358	679,788	11,173,189
Total.....										224,144,983

*Data by provinces not available.

†Included with Nova Scotia.

Table 443.—Production of Clay Products in Canada, from Domestic Clays, by Provinces, 1925–1927

Province	1925		1926		1927	
	Sold or used	Per cent of total value	Sold or used	Per cent of total value	Sold or used	Per cent of total value
	\$		\$		\$	
Prince Edward Island.....	3,020	0.03				
Nova Scotia.....	422,690	4.43	362,667	3.50	416,417	3.73
New Brunswick.....	69,473	0.72	75,851	0.73	87,185	0.78
Quebec.....	2,426,887	25.46	2,702,298	26.09	2,734,738	24.48
Ontario.....	5,195,084	54.51	5,356,469	51.72	5,853,035	52.38
Manitoba.....	173,794	1.82	248,497	2.40	201,464	1.80
Saskatchewan.....	95,952	1.06	214,113	2.07	311,204	2.79
Alberta.....	618,860	6.49	804,933	7.77	889,358	7.96
British Columbia.....	523,931	5.48	592,495	5.72	679,788	6.08
Canada.....	9,529,691	100.00	10,357,323	100.00	11,173,189	100.00

Table 444.—Value of Clay Products Produced in Canada from Domestic and from Imported Clays, 1926 and 1927

Product	From domestic clays		From imported clays		Total	
	1926	1927	1926	1927	1926	1927
	\$	\$	\$	\$	\$	\$
Fire clay blocks and shapes.....	54,064	100,659	323,168	331,000	377,232	431,659
Sanitary ware.....			351,125	422,447	351,125	422,447
Ceramic or glazed floor and wall tile.....			135,942	137,488	135,942	137,488
Pottery, glazed and unglazed.....	320,135	307,057	34,890	42,491	355,025	349,548
Electrical porcelain insulators.....			1,027,280	1,025,224	1,027,280	1,025,224
Other clay products (brick, tile, sewer pipe, etc.).....	9,983,124	10,765,473	167,109	129,588	10,150,233	10,895,061
Total.....	10,357,323	11,173,189	2,039,514	2,088,238	12,396,837	13,261,427

Table 445.—Production in Canada, Imports and Exports of Clay and Clay Products, 1925-1927

Kind	1925		1926		1927	
	Quantity	Total selling value	Quantity	Total selling value	Quantity	Total selling value
		\$		\$		\$
PRODUCTION—						
Brick: Soft mud process (Face..... M	27,701	521,739	28,235	556,573	16,196	325,966
Common..... M	51,214	753,470	78,158	1,145,490	70,554	1,091,274
Stiff mud process (Face..... M	93,903	1,883,856	101,028	2,146,362	95,480	2,024,064
(wire cut) Common..... M	116,105	1,635,257	94,046	1,624,055	150,222	2,239,180
Dry press (Face..... M	37,201	800,504	30,423	651,236	39,753	833,570
Common..... M	22,053	270,135	19,450	260,598	14,617	187,062
Fancy or ornamental brick (including special shapes, embossed and enameled brick)..... M	524	26,320	462	24,057	620	29,372
Sewer brick..... M	2,485	52,382	6,546	117,194	10,997	210,643
Paving brick..... M			122	5,015	50	2,106
Fire brick from domestic clay M	6,197	305,332	4,195	192,276	5,388	246,266
Fire clay..... tons	623	6,544	2,513	23,258	5,070	35,961
Kaolin.....					24	120
Fire clay blocks and shapes.....		36,567		54,064		100,659
Structural tile: Hollow blocks (including fireproofing and load-bearing tile)..... tons	115,576	1,093,397	142,061	1,314,650	151,307	1,431,141
Roofing tile..... No.	78,479	6,323	17,018	1,562	2,000	140
Floor tile (quarries) Sq. ft.	140,927	28,338	195,011	43,854	135,285	32,559
Drain tile..... M	14,552	401,503	14,258	396,018	22,259	598,098
Sewer pipe (including copings, flue linings, etc.)..... tons	73,791	1,440,269	75,996	1,480,776	77,262	1,475,875
Pottery, glazed or unglazed.....		267,255		320,135		307,057
Other products.....				150		2,076
Total.....		9,529,691		10,357,323		11,173,189
IMPORTS—						
Bath brick.....		695		97		
Building brick..... M	5,489	125,565	4,157	93,337	6,672	142,438
Building blocks.....		81,873		77,230		42,365
Clays—						
China..... cwt.	363,890	195,032	360,546	200,902	420,822	235,824
Fire..... cwt.	824,774	166,733	937,487	193,741	984,526	219,500
Pipe.....		1,668		1,323		2,258
Zirconium silicate.....				2,704		2,548
Other clays.....		64,498		81,253		90,183
Drain tile, unglazed.....		8,622		2,647		2,059
Drain and sewer pipe.....		66,960		65,487		77,274
Insulators, electric, porcelain.....				305,774		437,328
Earthenware and chinaware.....		4,558,194		4,647,395		5,549,327
Brick, fire, other, valued at not less than \$100 per M, rectangular shaped: the dimensions of each not to exceed 125 cubic inches for use exclusively in the construction or repair of a furnace, kiln, etc.....		27,113		41,690		20,634
Brick, fire, n.o.p., for use exclusively in the construction or repair of a furnace, kiln or other equipment of a manufacturing establishment.....		861,696		1,023,850		1,152,277
Fire brick, n.o.p.....		194,060		156,781		121,343
Fire brick, chrome.....		35,277		50,203		52,565
Magnesite brick.....		93,840		66,429		118,457
Silica brick.....		185,356		263,293		329,214
Paving brick..... M	1,563	39,901	2,678	72,989	2,051	54,561
Other clay manufactures.....		771,001		848,989		988,061
Total.....		7,478,084		8,196,014		9,638,216
EXPORTS—						
Building brick..... M	1,758	22,027	1,845	25,908	1,450	23,059
Clay—						
Unmanufactured..... cwt.	7,325	8,496	14,537	3,898	15,454	2,940
Manufactures.....		85,383		61,523		86,746
Earthenware.....		18,879		12,764		14,771
Porcelain insulators.....		88,033		120,823		155,196
Total.....		220,818		224,916		282,712

Table 446.—Production of Building Brick in Canada by Provinces, 1925-1927

		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1925									
Soft mud process.	Face.....	M		3	24,479	3,219			
		\$		35	476,638	45,066			
	Common.....	M	830	2,000	7,740	30,799	6,014	662	3,169
		\$	10,760	30,000	80,114	474,114	96,632	9,951	52,399
Stiff mud process (wire cut).	Face.....	M	1,435		21,224	68,975	324	560	852
		\$	29,180		506,113	1,288,382	8,404	17,104	17,963
	Common.....	M	*3,838		93,827	12,642	29	465	5,036
		\$	*47,995		1,328,403	195,202	283	6,531	52,645
Dry press	Face.....	M		2,919	32,016			77	922
		\$		91,551	638,812		2,634	16,525	50,982
Fancy or ornamental brick.	Common.....	M		800	4,587			11,930	4,486
		\$		2,800	7,200	64,377		137,436	58,322
Sewer brick.	Face.....	M		98	426				
		\$		4,592	21,728				
	Common.....	M			2,125				
		\$			37,082				
Total									
		M	*6,103	2,250	126,611	176,049	9,586	1,764	18,740
		\$	*87,935	32,800	2,018,008	3,196,335	150,385	36,220	197,911
1926									
Soft mud process.	Face.....	M	10		7,836	20,389			
		\$	200		196,829	359,544			
	Common.....	M	826		25,533	35,474	9,775	765	2,022
		\$	10,670		365,405	522,803	159,350	11,240	24,458
Stiff mud process (wire cut).	Face.....	M	1,262		17,156	76,078	3,181	1,252	951
		\$	25,139		442,738	1,537,450	45,778	35,365	21,111
	Common.....	M	3,845	2,372	68,131	12,110	105	2,728	4,271
		\$	50,002	34,258	1,247,875	206,242	1,050	31,428	45,208
Dry press	Face.....	M			26,462			593	2,070
		\$			539,855			21,422	39,064
Fancy or ornamental brick.	Common.....	M			39,689			159	13,236
		\$			374			2,138	164,771
Sewer brick.	Face.....	M		88	20,047				
		\$		4,010	6,397				
Total									
		M	5,943	2,372	119,044	180,339	13,061	5,497	22,550
		\$	86,011	34,258	2,256,857	3,337,249	206,178	101,593	294,612
1927									
Soft mud process.	Face.....	M	35		83	16,078			
		\$	735		1,243	323,988			
	Common.....	M	972	2,885	6,167	44,882	1,132	863	2,305
		\$	12,893	44,100	63,353	740,664	18,100	10,592	28,461
Stiff mud process (wire cut).	Face.....	M	1,345		24,762	65,894	143	1,419	1,545
		\$	31,068		577,348	1,321,604	3,800	42,711	35,613
	Common.....	M	3,887		106,341	21,177	7,291	5,709	5,619
		\$	47,549		1,627,330	310,344	122,019	66,654	62,892
Dry press	Face.....	M			2,134	32,699	947	576	2,448
		\$			63,047	641,903	21,921	19,197	48,467
Fancy or ornamental brick.	Common.....	M				1,147			13,470
		\$			101	519		174,346	
Sewer brick.	Face.....	M			25,016				
		\$			4,356				
Total									
		M	6,239	2,885	139,558	193,156	9,614	8,568	25,387
		\$	92,245	44,100	2,336,677	3,579,155	165,840	139,154	349,779
						202,920			7,237
									234,181

*Includes 180 M valued at \$2,520 from Prince Edward Island.

Table 447.—Production of Building Brick (Common and Pressed) in Canada, 1886-1923

Year	Common and Pressed*		Year	Common		Pressed		Total	
	Quantity	Value		Quantity	Value	Quantity	Value	Quantity	Value
	M	\$		M	\$	M	\$	M	\$
1886.....		873,600	1907.....	439,016	3,455,524	78,922	794,722	517,938	4,250,246
1887.....		986,689	1908.....	353,261	2,611,554	53,481	517,180	406,742	3,128,734
1888.....		1,036,746	1909.....	539,229	4,212,424	57,265	630,677	596,494	4,843,101
1889.....		1,273,884	1910.....	627,715	5,105,354	67,895	807,294	695,610	5,912,648
1890.....		1,266,982	1911.....	645,551	5,420,890	87,351	1,094,582	732,902	6,515,472
1891.....		1,061,536	1912.....	769,192	7,010,375	125,180	1,609,854	894,372	8,620,229
1892.....		1,251,934	1913.....	668,427	5,917,373	116,802	1,458,733	785,229	7,376,106
1893.....		1,800,000	1914.....	457,514	3,653,861	93,635	1,115,556	551,149	4,769,417
1894.....		1,800,000	1915.....	234,733	1,755,187	49,817	492,774	284,550	2,247,961
1895.....		1,670,000	1916.....	237,035	1,926,844	44,947	492,355	281,982	2,319,199
1896.....		1,600,000	1917.....	210,631	1,999,465	46,409	653,153	257,040	2,652,618
1897.....		1,600,000	1918.....	164,970	1,879,811	40,147	639,083	205,117	2,518,894
1898.....		1,900,000	1919.....	291,470	3,850,219	74,424	1,304,162	365,894	5,154,381
1899.....		2,195,000	1920.....	303,343	4,835,996	85,137	2,004,537	388,480	6,840,533
1900.....		2,275,000	1921.....	220,438	3,567,503	80,947	1,738,293	301,355	5,305,796
1901.....		2,400,000	1922.....	294,919	4,714,658	90,578	1,839,549	385,497	6,554,207
1902.....		2,593,000	1923.....	250,565	3,884,474	73,400	1,461,483	323,965	5,345,957
1903.....		2,832,000	Total.....						
1904.....		2,983,000							
1905.....	523,820	3,933,925							
1906.....	523,390	4,102,590							125,791,383

* Separate statistics not available till 1907.

Table 448.—Production of Building Brick in Canada, 1924-1927

	Soft mud process		Stiff mud process (wire cut)		Dry Press		Fancy or ornamental brick	Sewer orick	Total
	Face	Common	Face	Common	Face	Common			
	M	\$	M	\$	M	\$			
1924.....	10,831	50,079	80,565	124,556	35,203	12,794	755	2,690	317,473
1925.....	185,248	746,044	1,842,224	1,880,631	761,572	168,043	98,460	40,775	5,722,997
1926.....	27,701	51,214	93,903	116,105	37,201	22,053	524	2,485	351,186
1927.....	521,739	753,970	1,883,856	1,635,257	800,504	270,135	26,320	52,382	5,944,163
1927.....	28,235	78,158	101,028	94,046	30,423	19,450	462	6,546	358,348
1927.....	556,573	1,145,490	2,146,362	1,624,055	651,236	260,598	24,057	117,194	6,525,565
1927.....	16,196	70,554	95,480	150,222	39,753	14,617	620	10,997	398,439
1927.....	325,966	1,091,274	2,024,064	2,239,180	833,570	187,062	29,372	210,643	6,941,131
Total.....	82,963	250,005	370,976	484,929	142,588	68,914	2,361	22,718	1,425,446
	1,589,526	3,736,778	7,896,506	7,379,123	3,046,882	885,838	178,209	420,994	25,133,856

Table 449.—Production of Paving Brick* in Canada, 1897-1927

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	M	\$		M	\$		M	\$
1897.....	4,568	45,670	1906.....	3,000	45,000	1915.....	1,228	20,694
1898.....			1907.....			1916.....	1,590	30,144
1899.....	5,300	42,550	1908.....	3,618	72,354	1917-1921.....		
1900.....	2,710	26,950	1909.....	3,720	59,456	1922.....	151	5,972
1901.....	3,689	37,000	1910.....	3,760	67,408	1923-1925.....		
1902.....	4,211	42,000	1911.....	4,215	78,980	1926.....	122	5,015
1903.....	3,789	45,288	1912.....	5,220	79,444	1927.....	50	2,103
1904.....	4,436	55,450	1913.....	4,580	85,989	Total.....		
1905.....	4,500	54,000	1914.....	4,208	75,669		71,372	1,026,766
				2,707	49,627			

* Figures prior to 1907 compiled by the Ontario Bureau of Mines.

Table 450.—Production of Structural Tile in Canada, by Provinces, 1925-1927

Province	Hollow blocks (including fireproofing and load-bearing tile)		Roofing tile		Floor tile (quarries)	
	Tons	Value	No.	Value	Sq. ft.	Value
1925		\$		\$		\$
Nova Scotia.....	6,706	67,863				
Quebec.....	31,842	302,272				
Ontario.....	62,926	577,477	78,479	6,323	140,927	28,338
Manitoba.....	610	9,329				
Saskatchewan.....	2,700	27,052				
Alberta.....	5,166	49,831				
British Columbia.....	5,626	59,573				
Canada.....	115,576	1,093,397	78,479	6,323	140,927	28,338
1926						
Nova Scotia.....	5,141	60,615				
Quebec.....	33,627	281,342				
Ontario.....	76,794	710,595	17,018	1,562	195,011	43,854
Manitoba.....	2,511	29,132				
Saskatchewan.....	4,400	44,000				
Alberta.....	12,591	115,008				
British Columbia.....	6,997	73,958				
Canada.....	142,061	1,314,650	17,018	1,562	195,011	43,854
1927						
Nova Scotia.....	8,793	96,260				
Quebec.....	25,034	257,558				
Ontario.....	86,690	775,806	2,000	140	134,910	32,490
Manitoba.....	1,552	18,862				
Saskatchewan.....	6,500	65,000				
Alberta.....	15,345	142,156				
British Columbia.....	7,393	75,499			375	69
Canada.....	151,307	1,431,141	2,000	140	135,285	32,559

Table 451.—Production of Sewer Pipe in Canada, 1888-1927

Year	Value	Year	Value	Year	Tons	Value
	\$		\$			\$
1888.....	266,320	1902.....	301,965	1916.....		716,287
1889.....	*	1903.....	317,970	1917.....		783,762
1890.....	348,000	1904.....	440,894	1918.....	36,574	699,774
1891.....	227,300	1905.....	382,000	1919.....	62,821	1,074,146
1892.....	367,660	1906.....	530,045	1920.....	58,887	1,549,090
1893.....	350,000	1907.....	667,100	1921.....		1,666,584
1894.....	250,325	1908.....	514,362	1922.....	75,932	1,766,347
1895.....	257,045	1909.....	645,722	1923.....	70,252	1,616,324
1896.....	153,875	1910.....	774,110	1924.....	76,355	1,594,280
1897.....	164,250	1911.....	812,716	1925.....	73,791	1,440,269
1898.....	181,717	1912.....	884,641	1926.....	75,996	1,480,776
1899.....	161,546	1913.....	1,035,906	1927.....	77,262	1,475,875
1900.....	231,525	1914.....	1,104,499			
1901.....	248,115	1915.....	799,446	Total.....		28,282,568

*Data not available.

Table 452.—Production of Drain Tile in Canada, 1891-1927

Year	Value	Year	Value	Year	Value	Year	Quantity	Value
	\$		\$		\$		M	\$
*1891.....	90,000	1900.....	225,000	1909.....	408,440	1918.....	.....	499,340
1892.....	100,000	1901.....	250,000	1910.....	370,008	1919.....	20,078	616,510
1893.....	190,000	1902.....	250,000	1911.....	339,812	1920.....	14,527	562,652
*1894.....	280,000	1903.....	275,000	1912.....	357,862	1921.....	.....	473,952
1895.....	210,000	1904.....	260,000	1913.....	338,552	1922.....	14,728	407,386
1896.....	225,000	1905.....	260,000	1914.....	366,340	1923.....	10,599	323,314
1897.....	225,000	1906.....	290,000	1915.....	355,296	1924.....	15,137	409,369
1898.....	225,000	1907.....	260,609	1916.....	359,387	1925.....	14,552	401,503
1899.....	225,000	1908.....	298,561	1917.....	434,708	1926.....	14,258	396,013
						1927.....	22,259	593,098
						Total.....		12,157,717

*1891-1894 (inclusive), as reported by the Ontario Bureau of Mines.

Table 453.—Production of Drain Tile and Sewer Pipe, in Canada, by Provinces, 1926 and 1927

Province	1926				1927			
	Drain tile		Sewer pipe		Drain tile		Sewer pipe	
	M	\$	Tons	\$	M	\$	Tons	\$
Nova Scotia.....	53	1,877	11,532	209,465	53	1,610	10,501	202,741
Quebec.....	224	10,145	6,311	153,954	323	13,336	5,286	126,035
Ontario.....	12,788	340,403	48,176	835,206	20,330	521,957	50,828	852,187
Manitoba.....	275	13,187	.....	.....	343	16,762	—	—
Saskatchewan.....	20	600	.....	.....	25	800	—	—
Alberta.....	132	3,955	7,140	197,225	157	8,992	7,852	205,581
British Columbia.....	766	25,851	2,837	84,026	1,028	34,641	2,795	89,331
Canada.....	14,258	396,018	75,996	1,480,776	22,259	598,098	77,262	1,475,875

Table 454.—Production of Pottery from Domestic Clays in Canada, 1888-1927

Year	Value	Year	Value	Year	Value	Year	Value
	\$		\$		\$		\$
1888.....	27,750	1899.....	185,000	1910.....	250,924	1921.....	231,262
1889.....	.....	1900.....	200,000	1911.....	102,493	1922.....	266,391
1890.....	195,242	1901.....	200,000	1912.....	43,955	1923.....	229,547
1891.....	258,844	1902.....	200,000	1913.....	53,533	1924.....	238,342
1892.....	265,811	1903.....	200,000	1914.....	35,371	1925.....	267,255
1893.....	213,186	1904.....	140,000	1915.....	64,900	1926.....	320,135
1894.....	162,144	1905.....	120,000	1916.....	61,069	1927.....	307,057
1895.....	151,588	1906.....	150,000	1917.....	122,878		
1896.....	163,427	1907.....	253,809	1918.....	130,242		
1897.....	129,629	1908.....	200,541	1919.....	185,474	Total.....	7,036,930
1898.....	214,675	1909.....	285,285	1920.....	209,171		

*Data not available.

Table 455.—Production of Kaolin in Canada, 1912-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1912.....	20	160	1918.....	863	19,299	1924-1926.....		
1913.....	500	5,000	1919.....	759	13,744	1927.....	24	120
1914.....	1,000	10,000	1920.....	683	15,022			
1915.....	1,300	13,000	1921.....	124	1,888	Total.....	8,916	125,562
1916.....	1,750	17,500	1922.....	1,197	17,866			
1917.....	533	9,594	1923.....	163	2,369			

Table 456.—Production of Fire Clay in Canada, 1889-1927

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	Tons	\$		Tons	\$		Tons	\$
1889.....	400	4,800	1903.....	2,639	3,523	1917.....	10,534	49,455
1890.....			1904.....	5,972	17,466	1918.....	8,732	44,351
1891.....	250	750	1905.....	5,088	13,917	1919.....	4,600	24,163
1892.....	1,991	4,467	1906.....	6,559	18,522	1920.....	8,321	44,091
1893.....	540	700	1907.....			1921.....	2,931	29,851
1894.....	539	2,167	1908.....	1,984	8,121	1922.....	10,196	55,185
1895.....	1,329	3,492	1909.....	4,405	12,390	1923.....	2,685	24,158
1896.....	842	1,805	1910.....	1,425	5,863	1924.....	3,645	26,258
1897.....	2,118	5,759	1911.....	7,532	24,128	1925.....	623	6,544
1898.....	670	1,680	1912.....	6,307	24,343	1926.....	2,513	23,258
1899.....	599	1,295	1913.....	3,345	14,018	1927.....	5,070	35,961
1900.....	1,245	4,130	1914.....	2,171	12,875			
1901.....	3,979	5,920	1915.....	2,328	12,065	Total.....	136,054	602,521
1902.....	2,741	4,283	1916.....	9,206	30,767			

Table 457.—Production of Fire Brick and Other Fire Clay Products in Canada, from Domestic Clays, 1907-1927

Year	Fire brick		Other fire clay products	Year	Fire brick		Other fire clay products
	Quantity	Value	Value		Quantity	Value	Value
	M	\$	\$		M	\$	\$
1907.....	4,323	113,322	18,000	1918.....	7,192	248,894	111,589
1908.....	2,416	70,429	31,752	1919.....	5,610	268,756	96,435
1909.....	1,059	32,742	33,000	1920.....	7,293	375,230	54,792
1910.....	1,375	29,352	15,000	1921.....	4,502	242,462	91,685
1911.....	2,368	44,122	20,880	1922.....	6,705	251,776	67,588
1912.....	3,430	67,192	34,050	1923.....	6,122	295,037	81,345
1913.....	3,667	86,164	42,556	1924.....	4,327	209,256	51,273
1914.....	2,816	72,299	22,394	1925.....	6,197	305,332	36,567
1915.....	2,896	68,700	29,928	1926.....	4,195	192,276	54,064
1916.....	5,689	147,757	56,038	1927.....	5,388	246,266	100,659
1917.....	8,192	199,171	77,885	Total.....	95,762	3,566,525	1,127,480

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Table 458.—Production of Refractories, in Canada, from Domestic Clays, by Provinces, 1926 and 1927

Province	1926					1927				
	Fire clay		Fire brick		Fire clay blocks and shapes	Fire clay		Fire brick		Fire clay blocks and shapes
	Quantity	Value	Quantity	Value	Value	Quantity	Value	Quantity	Value	Value
	Tons	\$	M	\$	\$	Tons	\$	M	\$	\$
Nova Scotia.....	536	2,123	30	1,901	675	2,688	8,986	227	14,050	525
New Brunswick.....	47	1,819	25	1,372		53	2,112	40	2,216	
Saskatchewan.....	808	5,103	737	39,456	23,361	1,008	7,531	693	37,085	61,634
Alberta.....								107	5,850	
British Columbia.....	1,122	14,213	3,403	149,547	30,028	1,321	17,332	4,321	187,065	38,500
Canada.....	2,513	23,258	4,195	192,276	54,064	5,070	35,961	5,388	246,266	100,659

Table 459.—Principal Statistics of the Clay Products Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	219	221	32,294,371	4,730	5,011,700	2,667,115	1,867,898	10,483,016
1924.....	205	210	29,810,994	4,120	4,041,318	1,879,094	(a)	9,215,077
1925.....	183	188	27,760,864	4,136	4,034,075	1,909,591	(a)	9,529,691
1926.....	194	200	28,152,062	4,395	4,346,687	2,080,054	(a)	10,357,323
1927.....	185	194	30,437,607	4,776	4,769,307	2,088,724	(a)	11,173,189

(a) Data not available.

Table 460.—Principal Statistics of the Clay Products* Industry in Canada, by Groups, 1926 and 1927

	1926				1927			
	Brick and tile	Clay sewer pipe	Fire brick and fire clay	Stoneware and pottery	Brick and tile	Clay sewer pipe	Fire brick and fire clay	Stoneware and pottery
Number of firms.....	178	5	5	4	167	5	5	5
Capital employed.....\$	23,034,976	3,026,076	1,780,967	310,043	24,795,253	3,246,183	2,009,449	359,918
Salaried employees.....	272	24	23	10	298	26	22	11
Salaries paid.....\$	511,369	82,161	66,513	13,614	571,383	87,336	64,550	16,248
Average number of wage-earners.....	3,372	383	165	139	3,679	395	177	141
Wages paid.....\$	2,956,683	415,951	182,958	116,640	3,256,723	419,394	199,360	134,717
Cost of fuel and electricity.....\$	1,761,516	227,456	75,544	15,538	1,786,684	214,068	71,789	12,956
Value of products sold or used...\$	8,146,514	1,177,247	706,984	322,726	8,995,741	1,137,284	715,608	311,085

*Not including kaolin and other clays.

Table 461.—Plants Reporting Shipments in the Clay Products Industry in Canada, by Provinces, 1927

Province	Number of plants in groups indicated					Total
	Brick and tile	Clay sewer pipe	Fire brick and fire clay	Stoneware and pottery	Kaolin and other clays	
Nova Scotia.....	6	1	2		1	10
New Brunswick.....	1			2		3
Quebec.....	17	1	1		1	20
Ontario.....	125	3	1	2		131
Manitoba.....	4					4
Saskatchewan.....	6					6
Alberta.....	8		1	1		10
British Columbia.....	9				1	10
Canada.....	176	5	5	5	3	194

Table 462.—Capital Employed in the Clay Products Industry in Canada, by Provinces, 1926 and 1927

Industry and Province	1926				1927			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
By INDUSTRIES—								
<i>Brick and Tile—</i>								
Nova Scotia.....	291,216	38,629	61,891	391,736	293,706	34,135	85,021	412,862
New Brunswick.....	63,271	10,860	12,094	86,225	58,271	4,325	24,486	87,082
Quebec.....	8,003,408	626,444	394,508	9,024,360	8,749,788	632,280	507,019	9,889,087
Ontario.....	8,070,982	1,163,568	1,261,105	10,495,655	9,076,418	1,014,906	1,133,149	11,224,473
Manitoba.....	116,884	62,308	54,400	233,592	85,865	90,257	41,337	217,459
Saskatchewan.....	620,880	77,153	41,617	739,650	604,684	67,458	54,831	726,973
Alberta.....	855,652	123,572	73,878	1,053,102	844,000	126,324	104,988	1,075,312
British Columbia.....	838,399	121,075	71,182	1,030,656	882,995	181,875	97,225	1,162,095
Total for Canada.....	18,840,692	2,223,609	1,970,675	23,034,976	20,595,637	2,151,560	2,048,056	24,795,253
<i>Clay sewer pipe—</i>								
Total for Canada.....	2,356,077	355,813	314,186	3,026,076	2,394,988	514,806	336,389	3,246,183
<i>Fire brick and fireclay products—</i>								
Total for Canada.....	1,147,633	255,220	378,114	1,780,967	1,264,247	254,374	491,328	2,009,949
<i>Kaolin and other clays—</i>								
Total for Canada.....					12,266	2,668	11,370	26,304
<i>Stoneware and pottery—</i>								
Total for Canada.....	171,829	60,990	77,224	310,043	210,527	82,167	67,224	359,918
By PROVINCES—								
<i>Total for clay and clay products—</i>								
Nova Scotia.....	869,802	125,602	64,014	1,059,418	847,120	139,294	86,983	1,073,397
New Brunswick.....	75,700	23,127	21,818	120,645	70,700	24,092	34,210	129,002
Quebec.....	8,503,640	721,733	609,383	9,834,756	9,282,883	802,820	686,019	10,771,722
Ontario.....	10,150,773	1,406,165	1,593,036	13,149,974	11,164,549	1,398,446	1,488,325	14,051,320
Manitoba.....	116,884	62,308	54,400	233,592	85,865	90,257	41,337	217,459
Saskatchewan.....	620,880	77,153	41,617	739,650	604,684	67,458	54,831	726,973
Alberta.....	1,340,153	358,469	284,749	1,983,371	1,526,693	298,665	454,067	2,279,425
British Columbia.....	838,399	121,075	71,182	1,030,656	895,171	184,543	108,595	1,188,309
Canada.....	22,516,231	2,895,632	2,740,199	28,152,062	24,477,665	3,005,575	2,954,367	30,437,607

Table 463.—Employees, Salaries and Wages in the Clay Products Industry in Canada, by Provinces, 1926 and 1927

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1926						
				\$	\$	\$
Nova Scotia.....	10	193	203	28,100	113,935	142,035
New Brunswick.....	8	57	65	9,811	29,237	39,048
Quebec.....	68	880	948	132,301	842,452	974,753
Ontario.....	161	2,010	2,171	348,174	1,967,764	2,315,938
Manitoba.....	13	158	171	24,150	90,920	115,070
Saskatchewan.....	15	146	161	23,113	65,332	88,445
Alberta.....	31	315	346	64,866	296,958	361,824
British Columbia.....	23	307	330	43,142	266,432	309,574
Canada.....	329	4,066	4,395	673,657	3,673,030	4,346,687
1927						
Nova Scotia.....	9	197	206	28,100	141,200	169,300
New Brunswick.....	8	51	59	9,811	32,184	41,995
Quebec.....	78	1,001	1,079	149,938	918,489	1,068,418
Ontario.....	189	2,315	2,504	398,917	2,129,687	2,528,604
Manitoba.....	11	93	104	19,350	91,536	110,886
Saskatchewan.....	13	141	154	26,477	100,820	127,297
Alberta.....	30	322	352	62,211	319,988	382,199
British Columbia.....	22	296	318	49,563	291,045	340,608
Canada.....	360	4,416	4,776	744,367	4,024,940	4,769,307

* See note page 30.

Table 464.—Wage-Earners in the Clay Products Industry in Canada, by Months and by Industries, 1927

Month	Brick and tile	Clay sewer pipe	Fire brick and fire clay products	Stoneware and pottery	Kaolin and other clays	Total
January.....	1,715	402	123	131	5	2,376
February.....	1,599	388	127	133	4	2,251
March.....	2,045	391	173	134	11	2,754
April.....	2,693	373	177	143	14	3,400
May.....	3,695	388	176	150	12	4,421
June.....	4,071	398	183	145	11	4,808
July.....	4,178	403	191	139	9	4,920
August.....	3,994	408	205	138	20	4,765
September.....	3,687	411	194	136	15	4,443
October.....	3,519	403	192	139	22	4,075
November.....	2,914	402	190	130	28	3,664
December.....	2,292	385	155	133	25	2,990

Table 465.—Fuel and Electricity Used in the Clay Products Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	3,250	17,128	1,923	11,857
Bituminous coal—Canadian.....	Ton	204,111	1,447,523	30,019	203,472
Bituminous coal—Imported.....	Ton			187,496	1,176,044
Lignite coal—Canadian.....	Ton			16,257	40,161
Coke.....	Ton	8,986	19,356	2,961	22,626
Fuel oil and diesel oil.....	Imp. gal.	272,410	29,160	204,336	22,811
Gas—Manufactured.....	M cu. ft.	555,136	15,223	1,927	154
Gas—Natural.....	M cu. ft.			408,323	28,591
Gasoline.....	Imp. gal.			26,296	6,237
Kerosene or coal oil.....	Imp. gal.	22,130	6,883	1,060	231
Wood.....	Cord	57,967	263,881	62,951	302,027
Other fuel.....			51		378
Electricity purchased*.....	K.W.H.	15,729,185	253,851	16,063,068	274,135
Total.....			2,080,054		2,088,724
Electricity generated for own use*.....	K.W.H.			1,000	

*In 1926 the record shows only total electricity used.

Table 466.—Power Employed in the Clay Products Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	110	8,365	98	7,941
Gasoline, gas and oil engines.....	38	987	37	956
Hydraulic turbines and water wheels.....				
<i>Total primary power.....</i>	<i>148</i>	<i>9,352</i>	<i>135</i>	<i>8,897</i>
Electric motors run by purchased power.....	367	14,213	416	15,549
Total power employed.....	515	23,565	551	24,445
Electric motors run by primary power in same plant.....	9	267	3	69
<i>Total electric motors.....</i>	<i>376</i>	<i>14,480</i>	<i>419</i>	<i>15,617</i>
Boilers.....	120	9,349	109	8,637

IMPORTED-CLAY PRODUCTS

In continuance of the custom followed in previous mineral production reports, a short review of the imported-clay products industry is given herewith.

Thirteen plants in Canada producing clay products from imported clays during 1927 are included in this industry. The capital employed by these operators was \$2,834,820 and employment was furnished 652 persons whose earnings aggregated \$843,535. Production during the year had a total value of \$2,088,238 and the raw materials used in the manufacture of these commodities were valued at \$567,519.

At St. John's, Quebec, two plants produced sanitary ware from imported ball and china clays, while a third firm manufactured refractory products and vitrified sewer pipe. Refractory products were also made by one firm at Montreal, two at Toronto and one at Hamilton. Earthenware was produced at Iberville, Quebec, and Hamilton, Ontario. Porcelain insulators were manufactured in Ontario at Georgetown, Hamilton, Niagara Falls and Peterborough. Artware was produced at Oshawa and a plant at Kingston produced ceramic floor tile.

Table 467.—Principal Statistics of the Imported-Clay Products Industry in Canada, 1924-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Selling value of products
			\$		\$	\$	\$
1924.....	12	12	1,677,533	489	567,143	141,491	1,879,769
1925.....	12	12	2,762,951	552	653,211	170,339	1,741,745
1926.....	12	12	2,849,558	597	783,448	194,903	2,039,514
1927.....	13	13	2,834,820	652	843,535	185,779	2,083,238

Table 468.—Capital Employed in the Imported-Clay Products Industry in Canada, 1926 and 1927

	1926	1927
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	1,691,969	1,658,328
Cost of supplies and stocks on hand.....	611,697	722,593
Cash, trading and operating accounts and bills receivable.....	545,892	453,899
Total.....	2,849,558	2,834,820

Table 469.—Employees, Salaries and Wages in the Imported-Clay Products Industry in Canada, by Provinces, 1926 and 1927

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1926						\$	\$	\$
Quebec.....	26	4	200	5	235	69,401	252,091	321,492
Ontario.....	32	11	274	45	362	136,725	325,231	461,956
Canada.....	58	15	474	50	597	206,126	577,322	783,448
1927								
Quebec.....	29	3	207	6	245	68,824	253,028	321,852
Ontario.....	42	14	306	45	407	138,945	382,738	521,683
Canada.....	71	17	513	51	652	207,769	635,766	843,535

* See note page 30.

Table 470.—Wage-Earners in the Imported-Clay Products Industry in Canada, by Months, 1926 and 1927

Month	Number		Month	Number	
	1926	1927		1926	1927
January.....	510	495	July.....	524	525
February.....	516	504	August.....	533	521
March.....	530	503	September.....	520	522
April.....	527	506	October.....	530	517
May.....	530	521	November.....	565	504
June.....	511	535	December.....	566	505

Table 471.—Fuel and Electricity Used in the Imported-Clay Products Industry in Canada, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	900	9,161	53	824
Bituminous coal—Canadian.....	Ton	17,899	138,395	10,655	82,566
Bituminous coal—Imported.....	Ton			9,867	72,073
Coke.....	Ton	486	5,365	407	3,638
Fuel oil.....	Imp. gal.	229,360	17,064	4,337	421
Kerosene.....	Imp. gal.			400	90
Gas, natural.....	M cu. ft.	10,768	5,499	21,114	10,227
Wood.....		285	2,418	212	1,243
Other fuel.....			100		
Electric power purchased.....	K.W.H.	1,370,628	16,901	974,387	14,697
Total.....			194,903		185,779

LIME

CANADA

Statistics obtained during the census of 1871 show 1,010 lime kilns in operation in Canada. These kilns were located in Nova Scotia, New Brunswick, Quebec and Ontario. Capital invested in plant and equipment as recorded during that year was \$128,508, and employees numbered 2,042, earning \$157,943; the value of lime produced was \$502,156. A substantial growth was shown in this industry according to data obtained ten years later; active kilns had increased to 1,274 with a corresponding advance in capital investment to a total of \$309,354. Employment in 1881 was furnished 2,537 wage-earners who received \$203,631 and the value of lime produced was \$707,132.

Fifty-eight firms reported operations during 1920; their total production was valued at \$3,818,553. Labour statistics showed 1,069 men on the pay-rolls who received \$1,314,186. The next year there were 59 operators in this industry with a total capital investment of \$4,990,969. Securities issued by the joint stock companies carrying on lime burning as an independent enterprise in Canada in 1921, were valued at \$3,171,484 and consisted of issued common stock, \$3,149,900; bonds, \$3,601; and other securities, \$17,983. Canadian investors held 60 per cent of these issued securities; United States residents 38 per cent and the balance was held in Great Britain. Only 87 salaried officials receiving \$131,152 were engaged in the industry in Canada, during 1921, in addition to whom, wage-earners totalling 844 earning \$818,814, were employed in the operation of the plants.

Lime producers in Canada shipped 12,707,221 bushels of quicklime and hydrated lime in 1927; an increase of 7.5 per cent over the previous high mark for the industry of 11,825,736 bushels set up in 1926. The valuation of the 1927 shipments was \$3,923,388. Canadian producers received an average of 28.9 cents per bushel for quicklime and \$11.81 per ton for hydrated lime.

Lime importations into Canada increased 49.5 per cent in 1927 to a total of 165,243 bushels valued at \$70,075. Exports were recorded at 601,974 bushels with \$367,939.

The capital employed in the 60 plants operating during 1927 amounted to \$6,200,481. Employment statistics showed 97 salaried employees and 1,035 wage-earners engaged in this industry during the year; their earnings totalled \$1,133,708. Fuel used in the lime industry during 1927 necessitated the expenditure of \$783,032. Electric power used caused a further outlay of \$43,404. The total primary power installation consisted of 22 units with a rating of 718 h.p. Electric motors in operation during the year numbered 167 units rated at 3,578 h.p.

Table 472.—Production of Lime in Canada, 1886-1927

Year	Value	Year	Bushels	Value	Year	Bushels	Value
	\$			\$			\$
1886.....	283,755	1900 (Estimated).....	800,000	1914.....	7,028,582	1,360,628	
1887.....	394,859	1901 (Estimated).....	830,000	1915.....	5,047,244	1,015,702	
1888.....	339,951	1902 (Estimated).....	892,000	1916.....	5,493,250	1,091,463	
1889.....	362,848	1903 (Estimated).....	900,000	1917.....	6,567,170	1,558,487	
1890.....	412,308	1904 (Estimated).....	780,000	1918.....	6,363,951	1,876,025	
1891.....	251,215	1905 (Estimated).....	750,000	1919.....	7,147,504	2,310,607	
1892.....	411,270	1906.....	5,230,406	1,009,177	9,427,334	3,818,553	
1893 (Estimated)...	900,000	1907.....	4,755,316	974,595	6,879,066	2,781,197	
1894.....	900,000	1908.....	3,601,468	712,947	8,972,971	3,165,005	
1895.....	700,000	1909.....	5,592,924	1,132,756	10,035,319	3,266,608	
1896.....	650,000	1910.....	5,848,146	1,137,079	9,136,952	3,178,541	
1897.....	650,000	1911.....	7,533,525	1,517,599	10,256,542	3,387,652	
1898 (Estimated)...	650,000	1912.....	8,475,839	1,844,849	11,825,736	3,781,484	
1899 (Estimated) ..	800,000	1913.....	7,558,484	1,609,398	12,707,221	3,923,388	
				Total.....		59,111,946	

Table 473.—Production of Lime in Canada, 1926 and 1927, Showing Purposes for Which Sold or Used

Purpose for which sold or used	1926				1927			
	Quicklime		Hydrated lime		Quicklime		Hydrated lime	
	Bushels	Value	Tons	Value	Bushels	Value	Tons	Value
		\$		\$		\$		\$
Building trades.....	1,206,425	432,613	37,386	454,261	1,428,188	490,396	37,817	483,528
Chemical works.....	3,425,760	1,022,796	501	3,507	3,726,114	1,082,085		
Glass works.....	119,767	34,165			186,903	53,985		
Smelters.....	663,359	124,250			895,818	110,983		
Pulp and paper mills.....	2,527,255	622,440	5,382	39,757	2,536,096	606,752	6,457	49,698
Sugar refineries.....	298,561	100,394			213,766	74,876		
Tanneries.....	56,437	17,399	225	1,850	77,728	24,396	229	1,900
Agricultural uses (fertilizer).....	7,243	2,150	890	7,007	16,649	7,899	1,744	14,982
Dealers (uses unspecified).....	899,078	289,597	13,222	153,419	806,741	259,058	15,856	181,795
Other consumers.....	741,451	373,049	8,208	102,830	783,675	371,462	9,141	109,594
Total sold or used.....	9,945,336	3,018,853	65,814	762,631	10,671,678	3,081,891	71,244	841,497

Table 474.—Production of Lime in Canada, by Provinces, 1925-1927

Province		Quicklime		Hydrated Lime		Total	
		Sold or used		Sold or used		Sold or used	
		Bushels	Value	Bushels	Value	Bushels	Value
			\$		\$		\$
Nova Scotia.....	1925	57	20	8,200	3,444	8,257	3,464
	1926	446,626	56,777	7,171	3,000	453,797	59,777
	1927	872,914	100,134	286	120	873,200	100,254
New Brunswick.....	1925	202,106	92,216			202,106	92,216
	1926	477,226	196,477			477,226	196,477
	1927	343,111	148,321			343,111	148,321
Quebec.....	1925	2,272,751	601,081	269,486	72,249	2,542,237	673,330
	1926	2,509,006	667,480	340,629	98,636	2,849,635	766,116
	1927	2,773,648	725,876	302,171	80,789	3,075,819	806,665
Ontario.....	1925	5,115,974	1,566,540	1,188,857	477,585	6,304,831	2,044,125
	1926	5,402,261	1,593,468	1,120,486	457,978	6,522,747	2,051,446
	1927	5,668,087	1,657,552	1,278,543	540,687	6,946,630	2,198,239
Manitoba.....	1925	324,515	100,833	125,800	69,397	450,315	170,230
	1926	498,875	147,401	186,514	103,868	685,389	251,269
	1927	421,175	123,831	227,800	122,448	648,975	246,279
Alberta.....	1925	98,938	39,852			98,938	39,852
	1926	108,309	39,517			108,309	39,517
	1927	130,596	46,947			130,596	46,947
British Columbia.....	1925	515,058	304,223	134,800	60,212	649,858	364,435
	1926	503,033	317,733	225,600	99,149	728,633	416,882
	1927	462,147	279,230	226,743	97,453	688,890	376,683
Canada.....	1925	8,529,399	2,704,765	1,727,143	682,887	10,256,542	3,387,652
	1926	9,945,336	3,018,853	1,880,400	762,631	11,825,736	3,781,484
	1927	10,671,678	3,081,891	2,035,543	841,497	12,707,221	3,923,388

Table 475.—Imports into Canada and Exports of Lime, 1925-1927

Item	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Imports.....	4,700	47,639	3,868	42,855	5,784	70,075
Exports.....	16,286	312,168	18,712	344,616	21,069	367,939

Table 476.—Principal Statistics of the Lime Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	50	56	6,050,954	1,197	1,191,416	953,709	806,916	3,266,608
1924.....	49	49	5,165,964	927	970,672	740,878	757,898	3,178,541
1925.....	56	62	5,154,046	1,006	960,434	762,814	673,447	3,387,652
1926.....	54	60	5,825,809	1,106	1,082,854	788,990	(a)	3,781,484
1927.....	53	60	6,200,481	1,132	1,133,708	826,436	(a)	3,923,388

(a) Data not available.

Table 477.—Capital Employed in the Lime Industry in Canada, by Provinces, 1926 and 1927

Province	1926				1927			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
New Brunswick*	222,339	27,064	42,722	292,125	153,630	39,011	57,224	249,865
Quebec	1,194,764	168,214	252,927	1,615,905	1,176,779	179,793	359,822	1,716,394
Ontario	1,636,927	203,370	172,625	2,012,922	1,763,605	238,529	225,265	2,227,399
Manitoba	522,217	19,229	22,586	564,032	466,544	30,879	8,326	505,749
Alberta	134,328	14,995	18,063	167,386	139,578	22,981	20,703	183,262
British Columbia	1,002,481	51,598	119,360	1,173,439	1,102,043	86,227	129,542	1,317,812
Canada	4,713,056	484,470	628,283	5,825,809	4,802,179	597,420	800,882	6,200,481

*Includes data for Nova Scotia.

Table 478.—Employees, Salaries and Wages in the Lime Industry in Canada by Provinces, 1926 and 1927

Province	†Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1926				\$	\$	\$
New Brunswick*	13	119	132	19,706	73,078	97,784
Quebec	16	260	276	32,920	231,358	264,278
Ontario	37	408	445	72,727	412,988	485,715
Manitoba	7	84	91	11,200	62,576	73,776
Alberta	4	14	18	4,900	16,316	21,216
British Columbia	12	132	144	16,497	123,588	140,085
Canada	89	1,017	1,106	157,950	924,904	1,082,854
1927						
New Brunswick*	10	101	111	16,400	95,309	111,709
Quebec	18	262	280	32,415	227,582	259,997
Ontario	44	410	454	82,005	422,097	504,102
Manitoba	8	113	121	14,166	69,194	83,360
Alberta	4	20	24	4,900	22,336	27,236
British Columbia	13	129	142	18,309	128,995	147,304
Canada	97	1,035	1,132	168,195	965,513	1,133,708

* Includes data for Nova Scotia.

† See note page 30.

Table 479.—Wage-Earners in the Lime Industry in Canada, by Provinces and by Months, 1927

Month	New* Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January	98	182	336	57	10	117	800
February	89	218	322	63	12	107	811
March	97	201	352	68	19	115	852
April	104	228	364	81	20	135	932
May	106	286	382	88	23	142	1,027
June	97	290	373	106	26	141	1,033
July	97	312	401	115	20	140	1,085
August	88	285	404	143	25	147	1,092
September	99	294	391	129	23	144	1,080
October	100	261	423	112	21	129	1,046
November	94	212	422	92	18	121	959
December	86	194	371	81	18	108	858

*Includes data for Nova Scotia.

Table 480.—Fuel and Electricity Used in the Lime Industry in Canada, 1926 and 1927

Kind	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	1,226	5,687	1,307	6,425
Bituminous coal—Canadian.....	Ton	63,760	392,279	22,232	157,829
Bituminous coal—Imported.....	Ton			45,318	245,078
Lignite coal—Canadian.....	Ton	35	327		
Coke.....	Ton	9,948	72,810	9,982	71,814
Gas—Manufactured.....	M cu. ft.	32,613	9,343	174,736	13,979
Gas—Natural.....	M cu. ft.			6,500	3,900
Gasoline.....	Imp. gal.	1,088	339	4,552	1,114
Kerosene or coal oil.....	Imp. gal.			150	34
Wood.....	Cord	58,932	258,133	60,058	282,855
Other fuel.....					4
Electricity purchased*.....	K.W.H.	2,333,680	50,072	1,685,056	43,404
Total.....			788,990		826,436
Electricity generated* for own use.....	K.W.H.			357,645	

*In 1926, the record shows only total electricity used.

Table 481.—Power Employed in the Lime Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	23	1,034	14	549
Gasoline, gas and oil engines.....	7	79	5	132
Hydraulic turbines or water wheels.....	1	30	3	37
<i>Total primary power.....</i>	<i>31</i>	<i>1,143</i>	<i>22</i>	<i>718</i>
Electric motors run by purchased power.....	143	2,635	138	2,719
Total power employed.....	174	3,778	160	3,437
Electric motors run by primary power in same plant.....	34	615	29	859
<i>Total electric motors.....</i>	<i>177</i>	<i>3,250</i>	<i>167</i>	<i>3,578</i>
Boilers.....	20	1,078	23	1,400

SAND AND GRAVEL

Production statistics for the sand and gravel industry in Canada were first collected in 1912. Prior to that year the only data available consist of Customs' records of sand and gravel exported. In 1886 exportations amounted to 124,865 tons; twenty-four years later exports had risen to 624,824 tons appraised at \$407,974. During 1912, production was valued at \$1,512,099 and wages paid to the 875 pit employees totalled \$527,425. It was not until 1916 that tonnage statements were obtained from the operators in this industry; the total for that year amounted to 8,156,207 tons at \$1,838,320. Since 1918, the annual production has exceeded the 10-million-ton mark. The highest market valuation per ton for this material was received in 1920, when 11,530,795 tons were sold for \$4,201,067. During that year, the 186 producers employed 1,546 men whose total earnings were \$1,343,212. Statistics for 1922, showed that the investment in plant and equipment by the 342 sand and gravel operators amounted to \$4,098,928, while the 750 men employed received \$684,626 and produced 11,666,374 tons valued at \$3,502,935. In 1926 the 580 producers reported fixed and current assets at \$6,274,090. Employment during the year was furnished 5,672 persons whose earnings amounted to \$1,557,232 and the total production was 17,112,798 tons worth \$4,941,434. During 1927 a total capital investment of \$7,668,812 was reported by the 483 operators. Salaries and wages paid to the 7,133 employees totalled \$2,043,962 and the production for the year amounted to a record for the industry of 22,952,819 tons valued at \$6,055,601.

Imports of sand and gravel in 1927 were recorded at 289,741 tons worth \$200,470, and silica sand imported for the manufacture of glass and carborundum and for use in foundries amounted to 148,831 tons invoiced at \$346,138. Exports of sand and gravel decreased considerably in 1927 when 637,627 tons appraised at \$177,999 were shipped from Canada.

For statistical purposes, the sand and gravel industry has been divided into two parts comprising the operations of (1) railway companies producing sand and gravel for ballast and other purposes; (2) all other producers.

The figures given in the following tables do not include the operations of railway companies except where specifically mentioned. The railway companies were not asked to furnish any statistics for this industry other than the figures for production and employment, as, owing to the varied nature of their operations, it would have been difficult for them to give the detailed data generally required.

Table 482.—*Production of Sand and Gravel in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	124,865	24,226	1901.....	197,302	117,465	1916.....	8,156,207	1,838,320
1887.....	180,860	30,307	1902.....	159,793	119,120	1917.....	9,182,417	2,326,249
1888.....	260,929	38,398	1903.....	355,792	124,006	1918.....	11,262,282	2,367,018
1889.....	283,044	52,647	1904.....	399,809	189,803	1919.....	10,364,481	2,680,460
1890.....	342,158	65,518	1905.....	306,935	152,805	1920.....	11,530,795	4,201,067
1891.....	243,724	59,501	1906.....	336,550	139,712	1921.....	11,574,862	2,537,249
1892.....	297,878	85,329	1907.....	298,095	119,853	1922.....	11,666,374	3,502,935
1893.....	329,116	121,795	1908.....	298,954	161,387	1923.....	12,752,515	3,016,518
1894.....	324,656	86,940	1909.....	481,584	256,166	1924.....	11,603,500	3,181,083
1895.....	277,162	118,359	1910.....	624,824	407,974	1925.....	11,018,647	3,220,410
1896.....	224,769	80,110	1911.....	573,494	408,110	1926.....	17,112,798	4,941,434
1897.....	152,963	76,729	1912.....	.....	1,512,099	1927.....	22,952,819	6,055,601
1898.....	165,954	90,498	1913.....	.....	2,258,874			
1899.....	242,450	101,640	1914.....	.....	2,505,310	Total.....		51,099,458
1900.....	197,558	101,666	1915.....	.....	1,624,767			

* Exports prior to 1912 as no production statistics were collected.

Table 483.—Production in Canada, Imports and Exports of Sand and Gravel, 1925-1927

Kind	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Sand—						
Moulding sand.....	57,656	48,880	79,373	62,151	86,541	56,017
Building sand and sand for concrete, roads, etc.....	2,557,623	755,289	2,026,847	808,023	4,416,014	1,162,936
Other sand (including blast, core and engine sands).....	47,538	17,770	88,736	27,303	139,772	47,117
Sand and Gravel—						
Sand and gravel for railway ballast.....	3,950,328	570,235	6,595,161	774,055	8,294,927	1,167,916
Sand and gravel for concrete, roads, etc.	3,955,166	1,626,834	7,686,432	3,005,365	9,309,091	3,259,678
Crushed gravel.....	450,336	201,402	636,249	264,537	706,474	361,937
Total.....	11,018,647	3,220,410	17,112,798	4,941,434	22,952,819	6,055,601
IMPORTS—						
Sand, silica for glass and carborundum manufacture, etc.....	143,501	353,237	155,109	372,488	148,831	346,138
Sand and gravel, n.o.p.....	282,203	184,000	254,935	212,038	289,741	200,470
Total.....	425,704	537,237	410,044	584,526	438,572	546,608
EXPORTS.....	864,672	193,485	907,935	278,278	637,627	177,999

DOMINION BUREAU OF STATISTICS

Table 484.—Production of Sand and Gravel in Canada, by Railway Operators, 1925-1927

Kind	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
Sand—		\$		\$		\$
Moulding sand.....	526	780	365	540	1,256	1,669
Building sand and sand for concrete, roads, etc.....	26,769	10,816	85,885	17,096	13,018	10,112
Other sand (including blast, core and engine sands).....	38,095	8,927	42,385	8,140	83,261	13,127
Sand and Gravel—						
Sand and gravel for railway ballast.....	3,755,028	500,958	6,273,965	694,485	7,729,663	937,653
Sand and gravel for concrete, roads, etc....	389,280	95,294	212,306	48,588	130,795	50,660
Crushed gravel.....	1,215	1,665				
Total.....	4,210,913	618,440	6,614,906	768,849	7,957,993	1,013,221

Table 485.—Production of Sand and Gravel in Canada, by Operators Other than Railways, 1925-1927

Kind	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
Sand—		\$		\$		\$
Moulding sand.....	57,130	48,100	79,008	61,611	85,285	54,348
Building sand and sand for concrete, roads, etc.....	2,530,854	744,473	1,940,962	790,927	4,402,993	1,152,824
Other sand (including blast, core and engine sands).....	9,443	8,843	46,351	19,163	56,511	33,990
Sand and Gravel—						
Sand and gravel for railway ballast.....	195,300	69,277	321,196	79,570	565,264	230,263
Sand and gravel for concrete, roads, etc....	3,565,886	1,531,540	7,474,126	2,956,777	9,178,293	3,209,018
Crushed gravel.....	449,121	199,737	636,249	264,537	705,474	361,937
Total.....	6,807,734	2,601,970	10,497,892	4,172,535	14,994,826	5,042,380

Table 486.—Production of Sand and Gravel in Canada, by Provinces, 1925-1927

Kind	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1925								
Sand—								
Moulding sand..... tons			6	57,076	574			
\$			24	48,263	593			
Building sand and sand for concrete, roads, etc..... tons	4,787	40	1,088,619	1,355,834	34,717	216	26,139	47,271
\$	3,758	13	254,668	464,383	16,865	26	5,488	10,088
Other sand (including blast, core and engine sands)..... tons	3,357	1,049	8,593	14,016	317	12,220	7,567	419
\$	2,783	334	1,931	7,937	249	3,139	1,165	232
Sand and Gravel—								
Sand and gravel for railway ballast..... tons	*231,206	48,172	646,148	905,171	359,235	514,797	328,862	916,737
\$	31,818	8,018	101,336	85,804	40,710	68,718	42,326	191,505
Sand and gravel for concrete, roads, etc..... tons	45,949	20,895	459,830	2,440,932	332,309	52,668	171,601	430,882
\$	15,338	3,966	175,891	992,143	138,184	16,922	57,245	227,145
Crushed gravel..... tons	1,215			428,575			723	19,823
\$	1,665			180,599			1,212	17,926
Total..... tons	*286,514	70,156	2,293,196	5,201,604	727,152	579,901	534,892	1,415,232
\$	*55,362	12,331	533,850	1,779,129	196,601	88,805	107,436	446,896
1926								
Sand—								
Moulding sand..... tons	60			78,120	956			237
\$	150			59,482	1,062			1,457
Building sand..... tons	15,275		628,433	1,260,569	47,188	37,800	5,513	32,069
\$	14,097		197,045	540,213	20,670	25,500	2,042	8,456
Other sand (including blast, core and engine sands)..... tons	4,172	750	8,660	45,045	4,033	16,008	1,455	8,613
\$	3,275	364	1,105	16,419	635	3,305	334	1,866
Sand and Gravel—								
Sand and gravel for railway ballast..... tons	208,549	50,334	957,958	1,681,762	622,092	785,766	1,441,657	847,043
\$	34,288	6,902	133,834	149,683	73,065	108,905	178,576	88,802
Sand and gravel for concrete, roads, etc..... tons	2,250	19,847	3,528,459	2,924,523	302,882	24,327	285,851	598,293
\$	1,142	4,094	1,134,204	1,321,950	77,564	7,586	201,421	257,404
Crushed gravel..... tons			110,187	493,143	12,429		20,490	
\$			24,486	204,931	5,063		30,057	
Total..... tons	230,306	70,931	5,233,697	6,483,162	989,580	863,901	1,754,966	1,486,255
\$	52,952	11,360	1,490,674	2,292,678	178,059	145,296	412,430	357,985
1927								
Sand—								
Moulding sand..... tons	30			85,965	435			111
\$	75			54,806	453			683
Building sand..... tons	67		3,328,414	980,863	56,548	9,365	7,086	33,671
\$	25		696,691	426,118	19,843	7,566	2,833	9,860
Other sand (including blast, core and engine sands)..... tons	3,440	1,295	48,228	53,647	4,057	18,850	3,375	6,880
\$	2,591	370	6,746	31,470	1,196	2,450	563	1,731
Sand and Gravel—								
Sand and gravel for railway ballast..... tons	128,855	368,228	1,493,512	1,934,930	995,344	1,426,247	1,149,166	798,645
\$	16,144	114,460	288,172	198,602	130,963	214,619	104,641	100,315
Sand and gravel for concrete, roads, etc..... tons	680,584	18,543	3,744,536	3,823,518	248,648	37,689	215,737	539,836
\$	503,888	3,938	879,098	1,395,948	65,626	20,665	161,083	229,432
Crushed gravel..... tons		1,048	633,840	28,548		25,650	17,388	
\$			10,224	298,785	10,574	17,800	24,554	
Total..... tons	812,976	388,066	8,615,738	7,512,763	1,333,580	1,517,901	1,392,752	1,379,143
\$	522,723	118,768	1,880,931	2,405,729	228,655	263,100	293,674	342,021

Table 487.—Principal Statistics of the Sand and Gravel Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	598	598	4,487,005	801	692,161	99,409	270,554	3,016,518
1924.....	558	558	5,194,037	927	848,741	134,378	(a)	3,181,083
1925.....	622	622	5,286,268	1,650	1,231,856	158,645	(a)	3,220,410
1926.....	580	1,634	6,274,090	5,672	1,557,232	151,236	(a)	4,941,434
1927.....	483	2,503	7,668,812	7,133	2,043,962	188,327	(a)	6,055,601

(a) Data not available.

Table 488.—Capital Employed in the Sand and Gravel Industry in Canada, by Provinces, 1926 and 1927

Province	1926				1927			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	18,951			18,951				
Quebec.....	771,513	9,867	35,208	816,588	1,105,340	32,530	123,436	1,261,306
Ontario.....	3,457,853	37,032	206,851	3,701,736	4,061,806	42,742	441,919	4,546,467
Manitoba.....	266,015	5,505	66,499	338,019	292,549	7,200	82,108	381,857
Saskatchewan.....	39,750			39,750	54,750	2,000		56,750
Alberta.....	323,000	800	2,000	325,800	324,200	800	2,000	327,000
British Columbia.....	1,012,471	4,455	16,320	1,033,246	1,047,632	28,518	19,282	1,095,432
Canada.....	5,889,553	57,659	326,878	6,274,090	6,886,277	113,799	663,745	7,668,812

Table 489.—Employees, Salaries and Wages in the Sand and Gravel Industry by Provinces, 1926 and 1927

Province	†Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1926						
Nova Scotia*.....	1	12	13	150	3,191	3,341
Quebec.....	4	4,990	4,994	5,936	680,885	686,821
Ontario.....	52	444	496	118,157	521,379	639,536
Manitoba.....	7	35	42	14,070	31,880	45,950
Saskatchewan.....	1	7	8	139	19,900	20,039
Alberta.....	3	32	35	6,700	33,465	40,165
British Columbia.....	12	72	84	25,866	95,514	121,380
Canada.....	80	5,592	5,672	171,018	1,356,214	1,557,232
1927						
Nova Scotia*.....		210	210		27,548	27,548
Quebec.....	35	4,817	4,852	55,773	695,040	750,813
Ontario.....	57	849	906	118,975	671,923	790,898
Manitoba.....	9	228	237	15,970	89,769	105,739
Saskatchewan.....	4	351	355	4,000	107,476	111,476
Alberta.....	2	222	224	3,780	83,155	86,935
British Columbia.....	12	337	349	27,925	142,628	170,553
Canada.....	119	7,014	7,133	226,423	1,817,539	2,043,962

*Includes data for New Brunswick.

† See note page 30.

Table 490.—Wage-Earners in the Sand and Gravel Industry in Canada, by Months and by Provinces, 1927

Month	Nova Scotia and New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
January.....	1	43	197	6	3	2	56	308
February.....	5	77	234	5	3	2	67	393
March.....	3	99	358	11	3	16	182	672
April.....	4	180	480	57	3	65	203	992
May.....	44	388	674	157	217	137	254	1,871
June.....	82	4,592	790	215	231	146	255	6,311
July.....	141	4,592	796	206	178	148	202	6,263
August.....	100	634	776	136	116	141	197	2,100
September.....	36	895	764	70	57	74	225	2,121
October.....	37	811	732	41	48	37	198	1,904
November.....	14	322	617	23	25	33	160	1,194
December.....		135	473	10	3	3	49	673

Table 491.—Fuel and Electricity Used in the Sand and Gravel Industry in Canada, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Bituminous coal.....	Ton	250	2,754		
Subbituminous coal—Canadian.....	Ton	18,961	118,833	3,318	25,890
Subbituminous coal—Imported.....	Ton			23,334	134,157
Semianthracite coal—Canadian.....	Ton			891	2,673
Fuel oil and diesel oil.....	Imp. gal.	16,093	2,802	8,000	600
Gasoline.....	Imp. gal.	34,264	10,002	22,365	5,288
Kerosene or coal oil.....	Imp. gal.			3,884	788
Wood.....	Cord	243	1,192	205	1,460
Electricity.....	K.W.H.	873,980	15,653	1,818,770	17,471
Total.....			151,236		188,327

Table 492.—Power Employed in the Sand and Gravel Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total h.p. according to manufacturers' rating	Number of units	Total h.p. according to manufacturers' rating
Steam engines and turbines.....	84	5,725	66	3,511
Gasoline, gas and oil engines.....	33	715	25	555
Hydraulic turbines or water wheels.....	5	239	5	239
<i>Total primary power.....</i>	<i>122</i>	<i>6,679</i>	<i>96</i>	<i>4,305</i>
Electric motors run by purchased power.....	78	2,037	78	1,890
Total power employed.....	200	8,716	174	6,195
Electric motors run by primary power in same plant.....	7	395	6	220
<i>Total electric motors.....</i>	<i>85</i>	<i>2,432</i>	<i>84</i>	<i>2,110</i>
Boilers.....	50	5,505	36	4,062

SAND-LIME BRICK

Canada.—Production of sand-lime brick in Canada in 1927 totalled 72,864 thousand valued at \$864,911 as compared with 50,282 thousand worth \$606,409 in 1926. Eleven plants were in operation in 1927 of which 2 were in Quebec, 7 in Ontario and 2 in Manitoba; in 1926 ten establishments were active.

Capital employed in the industry in 1927 amounted to \$1,586,064 as against \$1,082,577 in the previous year; employees numbered 254 as against 218 in 1926 and materials used in manufacture cost \$258,777 as compared with a corresponding figure of \$197,400 in 1926.

Because of its association with other building materials, data regarding the production of sand-lime brick are included in this report. Statistics relating to sand-lime brick are not included in the totals for structural materials industries as both the sand and lime used have been so recorded; production of sand-lime brick is regarded as a manufacturing operation and therefore is shown in the report on the *Manufactures of Non-Metallic Minerals*, issued annually by the Bureau.

Table 493.—Principal Statistics of the Sand-Lime Brick Industry in Canada, 1923-1927.

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Selling value of products
			\$		\$	\$	\$
1923.....	8	8	1,042,619	225	285,248	50,810	897,960
1924.....	11	12	1,346,239	236	248,045	61,237	619,946
1925.....	9	10	960,729	239	257,116	62,044	854,057
1926.....	10	10	1,082,577	218	223,599	50,119	*629,6
1927.....	11	11	1,586,064	254	300,318	67,416	*939,911

*Includes value of hollow building blocks, etc., produced.

Table 494.—Sand-Lime Brick Manufactured in Canada, by Provinces, 1925-1927

Province	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
	M	\$	M	\$	M	\$
Quebec.....					8,182	96,926
Ontario.....	66,506	820,893	46,869	555,847	61,297	721,485
Manitoba.....	2,363	33,162	3,413	50,562	3,385	46,500
Total.....	68,869	854,055	50,282	606,409	72,864	864,911

SLATE

Slate deposits located along the south shore of the St. Lawrence river in Quebec were operated for the first time in 1854. Production from these deposits reached a maximum in point of value in 1889 when 6,935 tons valued at \$119,160 were shipped. These shipments consisted of roofing slates, mantles and slabs. Quarrying operations were carried on at the Quebec deposits up to 1923, in which year 1,836 tons of crushed green and red slate were shipped for use in the manufacturing of roofing paper. No production has been recorded since that date.

During 1908 a slate quarry was operated at Jarvis Inlet, British Columbia.

Imports of slate products into Canada during 1927 were valued at \$206,066 as compared with a valuation of \$218,142 in 1926.

Table 495.—Production of Slate in Canada, 1886-1927

Year	Tons*	Value	Year	Tons*	Value	Year	Tons*	Value
		\$			\$			\$
1886.....	5,345	64,675	1899.....		33,406	1912.....	1,894	8,939
1887.....	7,357	89,000	1900.....		12,100	1913.....	1,432	6,444
1888.....	5,314	90,689	1901.....	715	9,980	1914.....	1,075	4,837
1889.....	6,935	119,160	1902.....		19,200	1915.....	397	2,039
1890.....	6,368	100,250	1903*	5,510	22,040	1916.....	1,262	6,223
1891.....	5,000	65,000	1904.....	5,277	23,247	1917.....	1,422	7,789
1892.....	5,180	69,070	1905.....		21,568	1918.....	933	5,124
1893.....	7,112	90,825	1906.....		24,446	1919*	1,632	10,853
1894.....		75,550	1907.....	4,335	20,056	1920.....	(a)	14,200
1895.....		58,900	1908.....	2,950	13,496	1921.....	(b)	22,325
1896.....		53,370	1909.....	4,000	19,000	1922.....	1,899	14,871
1897.....		42,800	1910.....	3,959	18,492	1923.....	1,836	17,289
1898.....		40,791	1911.....	1,833	8,248	1924-1927.....		
						Total.....		1,326,292

*1903 to 1919 inclusive quantity recorded in squares.

(a) 1,532 squares valued at \$12,362 and 240 tons crushed slate at \$1,838.

(b) 415 squares valued at \$4,063 and 2,232 tons crushed slate at \$18,262.

Table 496.—Imports of Slate into Canada, 1925-1927

	1925		1926		1927	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
Roofing.....Squares	4,411	50,331	4,963	57,418	6,427	73,006
School-writing.....		102,878		92,766		72,101
Pencils.....		4,810		6,361		7,025
Mantles and manufactures of slate, n.o.p.		47,488		61,597		53,934
Total.....		205,507		218,142		206,066

STONE

Statistics of the stone industry as set forth in this report have been confined to quarrying operations and to the production of dressed stone when this operation is carried on in conjunction with the quarrying. The kinds of stone quarried in Canada include granite (trap-rock, syenite and other igneous rock), limestone, marble and sandstone. In 1927 granite was produced in Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia; limestone was obtained in all provinces except Prince Edward Island and Saskatchewan; marble was quarried in Quebec and British Columbia; and the sandstone output had its source in Nova Scotia, New Brunswick, Quebec and Ontario.

Granite production in Canada has increased from 6,062 tons in 1886 to a grand total in 1925 of 971,718 tons, 1,064,423 tons in 1926, and 730,049 tons in 1927.

The value of limestone production has advanced from a total of \$2,139,691 in 1909 to \$7,145,917 in 1927. During the latter year 85.0 per cent of the production was marketed as crushed stone for concrete aggregates, road metal and similar uses; 2.0 per cent as building, monumental and ornamental stone; 5.4 per cent for flux; 2.7 per cent for use in sugar factories, and chemical works; the balance or 4.9 per cent consisted of 294,931 tons of rubble and riprap and small tonnages of flagstones, curbstones, agricultural limestone and poultry grit. Limestone is also quarried for use in the production of cement and lime.

The production of marble in Canada during the period 1886-1896 was relatively small, totalling 3,391 tons valued at \$45,837. From 1897 to 1907, inclusive, records do not show any production of marble in Canada. With the opening of quarries at Philipsburg and South Stukely, Quebec; at Bancroft and Marble Bluff, Ontario; and near Lardeau and on Nootka Sound, British Columbia; the production became of considerable importance. In 1908 marble shipments were valued at \$125,000 but in 1912 an advance to a total valuation of \$260,764 was made. The

maximum output value for the industry of \$521,572 was reached in 1926 when 3,442 tons of marble for building purposes and 1,853 tons of crushed marble were shipped from Quebec and Ontario deposits. The 1927 production totalled 5,209 tons valued at \$503,037, consisting of 4,609 tons from Quebec and 600 tons from British Columbia.

Sandstone produced in Canada during 1909 was valued at \$374,179; the following year there was an increase in production to a total of \$502,148 the highest output value recorded for this industry. The period 1921-1923, inclusive, showed a considerable falling-off in production, but in 1924, an advance to 94,603 tons valued at \$240,273 was made. Shipments of sandstone during 1927 totalled 132,799 tons worth \$232,793.

Table 497.—Production of Granite in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	6,062	63,309	1901.....		155,000	1916.....		1,247,267
1887.....	21,217	142,506	1902.....		210,000	1917.....		639,412
1888.....	21,352	147,305	1903.....		200,000	1918.....		590,871
1889.....	10,197	76,624	1904.....		150,000	1919.....		850,563
1890.....	13,307	65,985	1905.....		226,305	1920.....		1,508,916
1891.....	13,637	70,056	1906.....		278,419	1921.....	319,398	937,894
1892.....	24,302	89,326	1907.....	151,136	194,712	1922.....	457,925	1,486,280
1893.....	22,521	94,393	1908.....		282,320	1923.....	398,432	1,159,303
1894.....	16,392	109,936	1909.....		454,824	1924.....	419,971	1,013,345
1895.....	19,238	84,838	1910.....		739,516	1925.....	971,718	2,014,535
1896.....	18,717	106,709	1911.....		1,119,865	1926.....	1,064,423	1,574,627
1897.....	10,345	61,934	1912.....		1,373,119	1927.....	730,049	1,383,557
1898.....	23,897	81,073	1913.....		1,653,791			
1899.....	13,418	90,542	1914.....		2,176,602			
1900.....		80,000	1915.....		1,525,553			
						Total.....		26,514,102

Table 498.—Production of Limestone and Sandstone in Canada, 1886-1927

Year	Lime- stone	Sand- stone	Year	Lime- stone	Sand- stone	Year	Limestone		Sandstone	
							Tons	Value	Tons	Value
		\$			\$			\$		\$
1886.....	650,384		1900.....		1,564,582	1914.....		2,672,781		487,140
1887.....	581,367		1901.....		1,837,737	1915.....		2,312,081		249,336
1888.....	664,825		1902.....		2,127,055	1916.....		2,224,091		146,244
1889.....	937,000		1903.....		2,230,939	1917.....		2,283,659		261,256
1890.....	984,787		1904.....		2,114,315	1918.....		2,342,403		102,750
1891.....	723,004		1905.....		2,072,758	1919.....		3,074,815		86,577
1892.....	633,188		1906.....		2,084,056	1920.....		5,665,693		165,149
1893.....	1,131,006		1907.....		1,832,550	1921.....	3,322,024	5,155,046	28,426	78,036
1894.....	1,269,645		1908.....		1,681,293	1922.....	3,152,124	4,175,941	25,221	80,908
1895.....	1,136,603		1909.....	2,139,691	374,179	1923.....	3,687,663	4,475,921	22,766	66,547
1896.....	1,042,850		1910.....	2,249,576	502,148	1924.....	4,249,061	4,831,684	94,603	240,273
1897.....	1,037,448		1911.....	2,594,926	451,183	1925.....	4,643,853	5,049,563	87,502	145,757
1898.....	1,335,403		1912.....	2,762,936	329,352	1926.....	5,283,745	5,657,328	44,127	112,347
1899.....	1,551,886		1913.....	3,204,091	396,782	1927.....	6,438,379	7,145,917	132,799	232,793
						Total.....		70,018,143		4,508,757

Table 499.—Production of Marble in Canada, 1886-1927

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	501	9,900	1897-1907.....			1918.....		550
1887.....	242	6,224	1908.....		125,000	1919.....		213,982
1888.....	191	3,100	1909.....		158,441	1920.....		240,593
1889.....	83	980	1910.....		158,779	1921.....	1,650	172,720
1890.....	780	10,776	1911.....		162,783	1922.....	1,912	231,894
1891.....	240	1,752	1912.....		260,764	1923.....	2,473	201,513
1892.....	340	3,600	1913.....		249,975	1924.....	4,379	322,455
1893.....	590	5,100	1914.....		132,533	1925.....	3,046	254,922
1894.....			1915.....		158,027	1926.....	5,295	521,572
1895.....	200	2,000	1916.....		118,810	1927.....	5,209	503,037
1896.....	224	2,405	1917.....		55,820			
						Total.....		4,290,012

Table 500.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1926

Item	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—								
Rough..... tons	535	550	36,145	22,540	34,380			94,150
Dressed..... tons	4,950	2,400	168,032	88,675	147,396			411,453
Monumental and ornamental—								
Rough..... tons		305	45,435	8,085	3,522	214	400	57,961
Dressed..... tons		5,328	640,754	75,559	134,953	8,064	5,800	870,458
Flagstone..... tons		400	9,837	816			3,218	14,271
Dressed..... tons		5,718	178,231	16,412			20,790	221,151
Flagstone..... tons	540	2,709	4,179	101			1,289	8,818
Dressed..... tons	33,050	54,316	517,428	5,372			57,210	667,371
Curbstone..... tons			200	836				1,036
Paving blocks..... tons		70	4,758	120	7,397			7,517
Limestone, for flux..... tons		848	24,391				1,550	26,789
Limestone, for sugar factories, chemical works, etc..... tons		20	5,658	1,550			5	7,233
Poultry grit..... tons		213	36,848	12,746			120	49,927
Crushed..... tons	74,435		3,674	134,586			46,924	309,619
Ground limestone for agricultural use..... tons	71,711		3,280	158,821			38,753	272,565
Rubble and riprap..... tons		13,800	106,834	59,767		3,545	34,358	218,314
Crushed..... tons		25,580	106,916	44,410		5,826	64,258	246,990
Poultry grit..... tons	2	2	10				2	16
Crushed..... tons	30	18	200				60	308
Ground limestone for agricultural use..... tons	8,016	1,192	3,008	1,443			552	14,211
Rubble and riprap..... tons	25,064	5,034	11,864	1,082			3,209	46,253
Crushed..... tons	8,487		91,056	136,543	9,360		10,994	256,440
Crushed..... tons	15,587		76,496	104,917	11,358		7,710	216,018
Crushed..... tons	300	60	1,994,040	3,205,775	54,309		155,208	5,410,592
Crushed..... tons	450	90	1,963,668	2,641,897	64,177		158,787	4,829,069
Total..... tons	92,315	19,108	2,305,734	3,622,042	101,571	3,759	253,061	6,397,590
Total..... \$	150,792	99,545	3,728,228	3,157,288	357,884	13,890	358,247	7,865,874
Per cent of total..... Quantity	1.44	0.30	36.94	56.61	1.59	0.06	3.96	100.00
Value	1.95	1.26	47.39	40.13	4.55	0.17	4.55	100.00

Table 501.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1927

Item	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—								
Rough..... tons	308	3,012	115,622	21,638	27,444		569	168,593
Dressed..... tons	2,920	7,994	212,359	143,149	109,974		6,353	482,749
Monumental and ornamental—								
Rough..... tons	24	207	43,060	10,026	3,050		330	56,697
Dressed..... tons	1,925	4,544	736,912	114,364	121,162		14,000	992,907
Flagstone..... tons								
Rough..... tons	2	627	8,256	63			1,968	10,916
Dressed..... tons	45	8,779	142,928	846			30,387	182,985
Flagstone..... tons	585	583	3,297	92			886	5,443
Dressed..... tons	34,800	40,450	478,120	3,602			41,778	598,750
Curbstone..... tons			240	1,292				1,532
Paving blocks..... tons			150	11,723				11,873
Limestone, for flux..... tons		25	16,332	6			8	16,371
Limestone, for sugar factories, chemical works, etc..... tons		352	68,687	150			200	69,419
Poultry grit..... tons		330	20,531	880			50	21,761
Crushed..... tons		2,796	122,986	8,919			20	135,201
Ground limestone for agricultural use..... tons	66,594		5,081	230,141			45,928	345,744
Crushed..... tons	69,092		2,773	187,068			39,060	296,993
Rubble and riprap..... tons		14,100	101,096	15,900	6,718	2,335	32,958	173,107
Crushed..... tons		23,535	76,510	11,330	9,518	3,808	64,824	189,525
Poultry grit..... tons		23		9			149	181
Crushed..... tons		197		45			1,021	1,263
Ground limestone for agricultural use..... tons	1,700	10,029	8,290	3,772			528	24,319
Rubble and riprap..... tons	6,200	31,199	28,835	2,681			2,727	71,642
Crushed..... tons	3,238		105,179	189,124	12,081		40,997	350,619
Crushed..... tons	5,825		78,078	115,678	11,291		35,049	245,921
Crushed..... tons		972	2,109,547	3,782,017	105,373	1,032	132,212	5,131,153
Crushed..... tons		1,215	2,319,977	3,461,154	66,611	4,022	133,097	5,986,076
Total..... tons	72,451	29,908	2,534,531	4,254,960	154,666	3,367	256,553	7,306,436
Total..... \$	120,807	121,091	4,263,315	4,060,769	318,556	7,830	367,996	9,265,304
Per cent of total..... Quantity	0.99	0.41	34.69	58.23	2.12	0.05	3.51	100.00
Value	1.30	1.31	46.07	43.83	3.44	0.08	3.97	100.00

Table 502.—Production of Stone in Canada, by Kinds and by Provinces, 1926 and 1927

Province	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1926		\$		\$		\$		\$
Nova Scotia.....	4,884	41,738	82,753	97,255			4,678	11,799
New Brunswick.....	3,824	66,423	15,054	30,722			230	2,400
Quebec.....	494,385	863,052	1,784,434	2,316,997	4,709	507,817	22,206	40,362
Ontario.....	398,253	359,217	3,214,544	2,742,424	586	13,755	8,659	41,892
Manitoba.....			101,571	357,884				
Alberta.....			3,545	5,826			214	8,064
British Columbia.....	163,077	244,197	81,844	106,220			8,140	7,830
Canada.....	1,064,423	1,574,627	5,283,745	5,657,328	5,295	521,572	44,127	112,347
1927								
Nova Scotia.....	611	36,770	68,294	75,292			3,546	8,745
New Brunswick.....	1,634	53,605	25,124	56,146			3,150	11,250
Quebec.....	162,180	757,582	2,251,499	2,863,690	4,609	484,437	116,243	162,606
Ontario.....	390,679	294,098	3,854,421	3,716,419			9,860	50,192
Manitoba.....			154,666	318,556				
Alberta.....			3,367	7,830				
British Columbia.....	174,945	241,412	81,008	107,984	600	18,600		
Canada.....	730,049	1,383,557	6,438,379	7,145,917	5,209	503,037	132,799	232,793

Table 503.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1926

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	8,442	85,931	78,616	287,501			7,092	38,021
Dressed.....	8,505	190,711	49,016	662,211	66	4,500	374	13,036
Monumental and ornamental—								
Rough.....	13,095	180,681	151	1,284	1,025	39,186		
Dressed.....	5,729	196,820	738	3,908	2,351	466,648		
Flagstone.....			200	120			836	7,397
Curbstone.....	4,929	26,789						
Paving blocks.....	7,233	49,927						
Limestone for flux.....			309,619	274,138				
Limestone for sugar factories, chemical works, etc.....			218,314	246,990				
Poultry grit.....	2	60	14	248				
Ground limestone for agricultural use.....			14,211	46,253				
Rubble and riprap.....	18,145	19,242	222,576	178,252			15,719	16,951
Crushed stone.....	998,343	824,466	4,390,290	3,956,423	1,853	11,238	20,106	36,942
Total.....	1,064,423	1,574,627	5,283,745	5,657,328	5,295	521,572	44,127	112,347

Table 504.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1927

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	3,576	25,877	82,933	300,147			82,084	156,725
Dressed.....	15,241	267,194	41,146	716,929			310	8,784
Monumental and ornamental—								
Rough.....	9,744	136,763	130	1,036	1,042	45,186		
Dressed.....	2,821	147,510	104	1,523	2,518	449,717		
Flagstone.....			312	484			1,220	11,389
Curbstone.....	16,365	69,269	6	150				
Paving blocks.....	21,761	135,201						
Limestone for flux.....			345,744	296,993				
Limestone for sugar factories, chemical works, etc.....			173,107	189,525				
Poultry grit.....	5	200	176	1,063				
Ground limestone for agricultural use.....			24,319	71,642				
Rubble and riprap.....	48,054	41,524	294,931	191,859			7,634	12,538
Crushed stone.....	612,482	560,019	5,475,471	5,374,566	1,649	8,134	41,551	43,357
Total.....	730,049	1,383,557	6,438,379	7,145,917	5,209	503,037	132,799	232,793

Table 505.—Production in Canada, by Kinds and by Provinces, and Imports and Exports of Stone, 1925-1927

	1925		1926		1927	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION, BY KINDS—						
Granite.....	971,718	2,014,535	1,064,423	1,574,627	730,049	1,383,557
Limestone.....	4,643,853	5,049,563	5,283,745	5,657,328	6,438,379	7,145,917
Marble.....	3,046	254,922	5,295	521,572	5,209	503,037
Sandstone.....	87,502	145,757	44,127	112,347	132,799	232,793
Total.....	5,706,119	7,464,777	6,397,590	7,865,874	7,306,436	9,265,304
PRODUCTION, BY PROVINCES—						
Nova Scotia.....	102,125	134,686	92,315	150,792	72,451	120,807
New Brunswick.....	25,391	124,743	19,108	99,545	29,908	121,091
Quebec.....	2,242,916	3,855,455	2,305,734	3,728,228	2,534,531	4,268,315
Ontario.....	3,022,712	2,817,333	3,622,042	3,157,288	4,254,960	4,060,709
Manitoba.....	52,770	188,496	101,571	357,884	154,666	318,556
Alberta.....	3,979	6,868	3,759	13,890	3,367	7,830
British Columbia.....	256,226	337,196	253,061	358,247	256,553	367,996
Canada.....	5,706,119	7,464,777	6,397,590	7,865,874	7,306,436	9,265,304
IMPORTS—						
Building stone, other than marble or granite, sawn on more than two sides, but not sawn on more than four sides.....	285	4,143	262	4,223	500	6,793
Building stone other than marble or granite, planed, turned, cut or further manufactured than sawn on four sides..	231	7,917	591	28,561	190	14,333
Flagstone, granite, rough sandstone, and all building stone, not hammered, sawn or chiselled.....		134,170		187,055		183,777
Flagstone and building stone, other than marble or granite, sawn on not more than two sides.....		97,875		95,790		101,006
Granite, sawn only.....		2,255		6,189		5,250
Granite, manufactures of, n.o.p.....		158,614		175,651		188,364
Quarrying blocks.....		67,507		91,039		92,077
Marble, rough, not hammered or chiselled		174,029		186,462		151,283
Marble, sawn or sand rubbed, not polished		40,293		101,748		103,603
Marble, manufactures of, n.o.p.....						
Refuse stone.....	160,997	100,544	334,832	220,177	352,467	213,609
Manufactures of stone, n.o.p.....		37,645		47,719		50,000
Total.....		524,992		1,144,614		1,116,106
EXPORTS—						
Crushed.....	42,518	81,764	101,117	134,755	46,772	66,820
Granite and marble, unwrought.....	3,430	36,552	3,553	38,828	3,314	33,289
Freestone, limestone, and other building stone, unwrought.....	4,166	14,389	2,853	3,915	712	7,437
Dressed.....		5,687		17,090		33,760
Total.....		138,392		194,588		141,306

Table 506.—Principal Statistics of the Stone Quarrying Industry in Canada, 1923-1927

Year	Number of firms	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Miscellaneous expenses	Selling value of products
			\$		\$	\$	\$	\$
1923.....	158	158	13,725,677	2,850	2,665,520	400,517	1,130,639	5,920,578
1924.....	170	170	14,317,148	2,877	2,768,256	383,800	1,329,233	6,407,757
1925.....	201	201	12,233,773	4,148	3,599,653	479,489	(a)	7,464,777
1926.....	229	234	12,760,078	4,510	3,763,726	514,374	(a)	7,865,874
1927.....	222	258	13,810,984	5,071	4,571,605	496,503	(a)	9,265,304

(a) Data not available.

Table 507.—Capital Employed in the Stone Quarrying Industry in Canada, by Provinces, 1926 and 1927

Province	1926				1927			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	1,133,993	22,968	9,041	1,166,002	1,115,816	26,422	784	1,143,022
New Brunswick...	128,488	37,172	17,919	183,579	120,792	32,879	17,350	171,021
Quebec.....	3,772,637	407,020	733,333	4,912,990	3,295,983	593,599	811,303	4,700,885
Ontario.....	4,808,347	290,343	498,879	5,597,569	5,774,455	287,235	560,842	6,622,532
Manitoba.....	288,553	25,505	40,087	354,145	292,396	33,709	163,818	489,923
Alberta.....	4,000	.....	1,300	5,300	.....	.....	.....	.....
British Columbia..	459,340	46,881	34,272	540,493	591,363	54,480	37,758	683,601
Canada.....	10,595,358	829,889	1,334,831	12,760,078	11,190,805	1,028,324	1,591,855	13,810,984

Table 508.—Employees, Salaries and Wages in the Stone Industry in Canada by Provinces, 1926 and 1927

Province	*Average number of employees			Salaries and Wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1926						
Nova Scotia.....	6	86	92	8,570	64,585	73,155
New Brunswick...	5	77	82	6,176	53,549	59,725
Quebec.....	124	2,214	2,338	212,061	1,779,056	1,991,087
Ontario.....	86	1,579	1,665	141,076	1,106,621	1,247,697
Manitoba.....	7	140	147	15,449	156,825	172,274
Alberta.....	.....	7	7	.....	6,851	6,851
British Columbia..	13	166	179	28,100	184,837	212,937
Canada.....	241	4,269	4,510	411,432	3,352,294	3,763,726
1927						
Nova Scotia.....	5	78	83	5,504	57,773	63,277
New Brunswick...	10	94	104	12,810	56,611	69,421
Quebec.....	120	2,969	3,089	200,509	2,564,970	2,765,479
Ontario.....	82	1,396	1,478	160,571	1,143,335	1,303,956
Manitoba.....	7	148	155	16,554	168,556	185,110
British Columbia..	10	152	162	23,915	160,447	184,362
Canada.....	234	4,837	5,071	419,863	4,151,742	4,571,605

* See note page 30.

Table 509.—Wage-Earners in the Stone Industry in Canada, by Months and by Provinces, 1927

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	British Columbia	Canada
January.....	22	37	1,428	401	117	98	2,103
February.....	20	37	1,682	572	120	111	2,542
March.....	66	77	1,965	680	113	153	3,054
April.....	81	84	2,244	946	110	163	3,628
May.....	89	92	2,739	1,272	126	134	4,452
June.....	88	96	3,024	1,497	180	153	5,038
July.....	87	96	3,415	1,465	185	151	5,399
August.....	85	95	3,531	1,543	175	154	5,583
September.....	76	98	3,206	1,433	194	155	5,162
October.....	74	100	2,676	1,208	156	150	4,364
November.....	63	87	2,159	962	126	143	3,545
December.....	56	61	1,849	505	109	92	2,672

Table 510.—Fuel and Electricity Used in the Stone Industry in Canada, 1926 and 1927

	Unit of measure	1926		1927	
		Quantity	Value	Quantity	Value
			\$		\$
Anthracite coal.....	Ton	625	4,904	950	7,413
Bituminous coal—Canadian.....	Ton	28,918	218,617	6,403	48,281
Bituminous coal—Imported.....	Ton			24,064	148,540
Lignite coal—Canadian.....	Ton	8	112		
Coke.....	Ton	337	935		
Fuel oil and diesel oil.....	Imp. gal.	46,195	3,774	65,518	5,739
Gasoline.....	Imp. gal.	103,029	30,899	114,594	27,353
Kerosene or coal oil.....	Imp. gal.			5,670	1,709
Wood.....	Cords	3,981	18,114	4,854	22,883
Electricity purchased*.....	K.W.H.	10,695,084	237,019	13,938,544	234,585
Total.....			514,374		496,593
Electricity* generated for own use.....	K.W.H.			177,260	

* In 1926 the record shows only total electricity used.

Table 511.—Power Employed in the Stone Industry in Canada, 1926 and 1927

Description	1926		1927	
	Number of units	Total H.P. according to manufacturers' rating	Number of units	Total H.P. according to manufacturers' rating
Steam engines and turbines.....	184	5,311	123	4,967
Gasoline, gas and oil engines.....	52	943	62	1,656
Hydraulic turbines or water wheels.....	11	1,125	7	749
<i>Total primary power.....</i>	<i>247</i>	<i>7,379</i>	<i>192</i>	<i>7,372</i>
Electric motors run by purchased power.....	466	15,570	533	18,461
Total power employed.....	713	22,949	725	25,833
Electric motors run by primary power in same plant.....	52	2,186	20	773
<i>Total electric motors.....</i>	<i>518</i>	<i>17,756</i>	<i>553</i>	<i>19,234</i>
Boilers.....	97	4,706	104	5,264

CHAPTER XI

DIRECTORY

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given and the location of the properties worked in 1927 is also shown.

METAL MINING INDUSTRIES

Alluvial Gold Mining Industry

Name	Address	Location
BRITISH COLUMBIA		
Adams, Geo.	Atlin	McKee Creek.
Bride, Maurice	Atlin	Lynn Creek.
Brown, F. and Marshall, J.	Atlin	Wright Creek.
Browne, John W.	Atlin	Spruce Creek.
Bryan, Tom	Porter Landing	Dease Creek.
Campbell, Robert	Grand Forks	McRae Creek.
Clay, J. R.	Atlin	Spruce Creek.
Cole and Tintinger	Atlin	Spruce Creek.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Antler Creek.
Cronholme, F. W.	425 Crescent Heights Blvd. Hollywood, California	Clearwater River.
Dease Creek Mines Corporation	401 Mutual Life Bldg., Seattle, Wash.	Dease Creek.
Discovery Mining and Power Co.	2565 West 5th, Vancouver 1	Pine Creek.
Enterprise Mining Partnership Ltd.	Lillooet	Cayoosh Creek.
Falconer, D. K.	Discovery	Spruce Creek.
Fales, J. E. and Willoughby, O. L.	Lumby	
Harris, A. D. Ford, R. J. and Wade L.	Barriere	Dixon Creek.
Hartman, C. W.	Coalmont	Granite Creek.
Haylmore, W.	Bridge River	
Kaife Copper Development Co. Ltd.	612 Pacific Bldg. Vancouver	Cunningham Pass.
Ketch Hydraulic Co.	Barkerville	Canyon Creek.
Lake Surprise Mining Co.	1002 Third Ave. Seattle Wash.	Ruby Creek.
Matthews, Isaac	Atlin	Spruce Creek.
Mathias Gold Mining Co. of B. C. Ltd.	Williams Lake	
McKinnon, C. E. and Hensley, E.	Atlin	Placer Creek.
Mines D'Otter Creek	Atlin	Otter Creek.
Morse, H. O. and McKechnie, Wm.	Atlin	Spruce Creek.
Mosquito Hydraulic Association	727-23rd Ave. S. Seattle, Wash.	Mosquita Creek.
Nelson, A. Holmgren, G. and Nelson, A.	Atlin	Boulder Creek.
Prpriet, Thomas	Atlin	Last Chance, Creek.
Quartz Creek Syndicate	Golden	Porcupine Creek.
Rees, R. D.	Barkerville	Shepherd Creek.
Siwash Creek Development Co. Ltd.	Vernon	Vernon Mining Division.
Sotheran, Garnet	Tulameen	Similkameen Mining Division.
Sundberg, M.	Cottonwood	Donovan Creek.
Thompson, Mrs. Flora	McGillivray Falls	McGillivray Creek.
Tregillus, F. and House, J. S.	Barkerville	Cunningham Creek.
Turnquist, Emil	Atlin	Ruby Creek.
Williams, James F.	Cariboo	Last Chance Creek.
YUKON		
Burrall and Baird, Ltd.	Dawson	
New North West Corporation, Ltd.	Dawson	
North American Transportation and Trading Co.	Dawson	

Antimony Mining Industry

Name	Address	Name of Mine	Location
NEW BRUNSWICK			
*Lake George Syndicate	718 Sherbrooke St. W., Montreal.		Lake George.

Auriferous Quartz Mining Industry

NOVA SCOTIA			
Acadia Gold Mines, Ltd.	850 1st National Bk. Bldg., Chicago.	Acadia	Enfield.
*Bower Mining Co. Ltd.	Yarmouth.	Bower	Yarmouth Co.
Cameron, L. B.	Eureka.	O'Brien	Hants Co.
*Cochrane Hill Gold Mining Co.	682 Barrington St., Halifax.		Guysborough Co.
Consolidated Mines and Power Co.	170 Summer St., Boston, U.S.A.	Goldenville	Goldenville.
Hiseler, S. A., Emmett, J. H. and Norton, J. C. A.	Halifax.	Parker, Douglas and Fisk	Queens Co.
*Malaga Mining Co. Ltd.	Malaga.	Malaga	Queens Co.
Metals Mining and Smelting Corporation of Canada Ltd.	Box 484 Halifax.	Montague and Boston Richardson	Guysborough Co.
*Oldham Mining Co.	Truro.	Oldham	Halifax Co.
*Papke Wm.	St. Peter St., Quebec.	Beaverdam	Beaverdam dist.
*Tangier Mining and Power Co. Ltd.	Tangier.		Tangier.
*Victory Gold Mines, Ltd.	36 King St., E. Toronto.	Victory.	Goldboro.

* Operating but not producing.

Auriferous Quartz Mining Industry—Continued

Name	Address	Name of Mine	Location
ONTARIO			
<i>Boston Creek Area—</i>			
Barry Hollinger Gold Mines, Ltd.....	807 General Assurance Bldg., Toronto.	Barry Hollinger.....	Pacaud Tp.
*McMaster Syndicate.....	Rosegrove.....	Bulldog.....	Rosegrove.
*Ostrom Gold Mines, Ltd.....	331 Bay St., Toronto.....	Ostrom.....	Boston Creek.
<i>Afton Townships—</i>			
*Afton Mines, Ltd.....	Temagami.....		Afton Tp.
<i>Frontenac County—</i>			
*Ore Chimney Mining Co., Ltd.....	Northbrook.....	Ore Chimney.....	Barrie Tp.
<i>Kalader Township—</i>			
*Cobalt Frontenac Mining Co., Ltd.....	Flinton.....	Golden Fleece.....	Kalader Tp.
<i>Kirkland Lake Area—</i>			
*Conroyal Mines Ltd. and Kirk Gold Mines Ltd.....	911 Kent Bldg., Toronto.....	Conroyal.....	Lebel Tp.
*Harvey Kirkland Mines, Ltd.....	406 C.P.R. Bldg., Toronto.....	Harvey Kirkland.....	Lebel Tp.
*King Kirkland Gold Mines, Ltd.....	504 Kent Bldg., Toronto.....	King Kirkland.....	Kirkland Lake.
*Kirkland Hudson Bay Gold Mines, Ltd.....	New Liskeard.....	Kirkland Hudson Bay..	Teck Tp.
Kirkland Lake Gold Mining Co., Ltd.....	810 Lumsden Bldg., Toronto 2	Kirkland Lake.....	Teck Tp.
Lake Shore Mines, Ltd.....	Kirkland Lake.....	Lake Shore.....	Teck Tp.
*Lebel Oro Mines, Ltd.....	Bank of Toronto Bldg., Toronto.	Lebel Oro.....	Lebel Tp.
*Macassa Mines, Ltd.....	Kirkland Lake.....	Macassa.....	Kirkland Lake.
*Pawnee Kirkland Gold Mines Ltd.....	156 Yonge St., Toronto.....	Pawnee Kirkland.....	Kirkland Lake.
Sylvanite Gold Mines, Ltd.....	Kirkland Lake.....	Sylvanite.....	Teck Tp.
Teck Hughes Gold Mines, Ltd.....	Kirkland Lake.....	Teck Hughes.....	Teck Tp.
Tough-Oakes Burnside Gold Mines.....	127 Bay St., Toronto.....	Tough Oakes Burnside..	Teck and Lebel Tps
Wright Hargreaves Mines, Ltd.....	Bridgeburg.....	Wright Hargreaves.....	Teck Tp.
<i>Larder Lake Area—</i>			
Argonaut Consolidated Mines Ltd.....	145 St. James St. Montreal...	Argonaut.....	Gauthier Tp.
Canadian Associated Goldfields, Ltd.....	15 Wellington St. W., Toronto...	Castello.....	Larder Lake.
*Crown Reserve Mining Co., Ltd.....	18 Toronto St., Toronto.....	Crown Reserve.....	Larder Lake.
*Northland Gold Mines, Ltd.....	Northland Mines.....	Northland Gold.....	Gauthier Tp.
*Walsh Katrine Gold Mines, Ltd.....	Box 361 Cobalt.....	Walsh Katrine.....	Katrine Tp.
<i>Lightning River Area—</i>			
*Blue Quartz Gold Mines, Ltd.....	1104 Northern Ont. Bldg., Toronto.	Blue Quartz.....	Painkiller Lake.
<i>Michipicoten Area—</i>			
*Cooper Gold Mines, Ltd.....	302 Bay St., Toronto.....	Cooper Gold.....	Michipicoten.
<i>North Western Ontario Area—</i>			
*British Canadian Mines, Ltd.....	8 Bloor St. E., Toronto.....	Foley.....	Rainy River Tp.
*Northern Red Lake Mining Co.....	Fort William.....	Golden Star.....	Rainy River Tp.
*Bonanza United Mines.....	806 Royal Bank Bldg., Toronto.	Bonanza, Redeemer, Rognon.	Van Horne.
<i>Porcupine Area—</i>			
Ankerite Gold Mines, Ltd.....	Box 535 South, Porcupine.....	Ankerite.....	Deloro Tp.
*Coniaurum Mines, Ltd.....	50 Ontario St., St. Catharines.	Coniaurum.....	Tisdale Tp.
Consolidated West Dome Lake Mines, Ltd.....	204 McKinnon Bldg., Toronto.	Consolidated West Dome.	Tisdale Tp.
Dome Mines, Ltd.....	36 Toronto St., Toronto.....	Dome.....	Tisdale Tp.
Hollinger Consolidated Gold Mines, Ltd.....	Timmins.....	Hollinger.....	Tisdale Tp.
March Gold, Ltd.....	White Bldg., Buffalo, N.Y....	March Gold.....	Deloro Tp.
McIntyre Porcupine Mines, Ltd.....	Schumacher.....	McIntyre Porcupine.....	Tisdale Tp.
Porcupine Paymaster Mines, Ltd.....	South Porcupine.....	Paymaster.....	Deloro Tp.
Vipond Consolidated Mines, Ltd.....	302 Bay St., Toronto.....	Vipond.....	Tisdale Tp.
<i>Sudbury Area—</i>			
*Mundell, Wm.....	Metagama.....	Ina.....	Sudbury Dist.
<i>McMurphy Township—</i>			
*Atlas Gold Mines.....	133 Queen St. W., Toronto.....	Atlas.....	West Shining Tree.
<i>Mongowin Township—</i>			
*McMillan Gold Mines, Ltd.....	Sudbury.....	House Lake.....	Mongowin Tp.
<i>Temiskaming District—</i>			
Gold Hill Mines, Ltd.....	Haileybury.....	Gold Hill.....	Catharine Tp.
*Manor Gold Mines, Ltd.....	17 Main St. E., Hamilton.....	Manor Gold.....	Skead Tp.
<i>Whitney Township—</i>			
Scottish Ontario Syndicate.....	Porcupine.....	Scottish Ontario.....	Whitney Tp.
MANITOBA			
Central Manitoba Mines, Ltd.....	350 Bay St., Toronto.....	Kitchener.....	Long Lake Dist.
BRITISH COLUMBIA			
*Big Horn Mines Ltd., (formerly Horn Silver Mining Co.).....	410 Seymour St., Vancouver...	Horn Silver.....	Osoyoos Mining Div.
Boschart, Louis.....	Greenwood.....	Gold Drop.....	Greenwood.
B.C. Silver Mines, Ltd.....	612 Pacific Bldg., Vancouver..	B. C. Silver.....	Portland Canal Mining Division.
Coronation Consolidated Mining Co., Ltd.....	106 London Bldg., Vancouver..	Coronation.....	Lillooet Mining Division
*Director Gold Mining Co., Ltd.....	Box 149 Abbotsford.....	Emancipation.....	Yale Mining Division.
Engineer Gold Mines, Ltd.....	120 Broadway New York, N.Y.	Engineer.....	Atlin Mining Division.

* Operating but not producing.

Auriferous Quartz Mining Industry—Concluded

Name	Address	Name of Mine	Location
<i>BRITISH COLUMBIA—Concluded</i>			
Esperanza Mines.....	Box 235 Anyox.....	Esperanza.....	Naas River Mining Div.
Hedley Gold Mining Co., Ltd.....	Hedley.....	Nickel Plate.....	Osoyoos Mining Div.
I. X. L. Gold Mining and Milling Co.....	Tacoma, Wash.....	I. X. L.....	Rossland.
*Oscarson, Roger.....	Erie.....	Second Relief.....	Nelson.
Premier Gold Mining Co., Ltd.....	London Bldg., Vancouver.....	Premier.....	Portland Canal Mining Division.
*Premier Gold Mining Co., Ltd.....	London Bldg., Vancouver.....	Prosperity.....	Portland Canal Mining Division.
*Princeton Mining Development Co., Ltd.....	709 Dunsmuir St., Vancouver.....		Similkameen Mining Division.
Sloan, D.....	Bridge River.....	Pioneer.....	Lillooet Dist.
White, Geo.....	Box 520 Greenwood.....	Jewel.....	Yale Dist.
*Windpass Gold Mining Co. Ltd.....	Box 1024 Fernie.....	Windpass.....	Kamloops Mining Div.

Copper-Gold-Silver Mining Industry

QUEBEC			
*Abana Mines Ltd.....	95 St. James St., Montreal.....	Abana.....	Dupuy Tp.
*Abbey Mines Ltd.....	205 St. James St., Montreal.....	Abbey.....	Dupuy Tp.
*Abondé Mines, Ltd.....	134 King St. E., Toronto.....	Abondé.....	Dupuy Tp.
*Alamac Mines, Ltd.....	Power Bldg., Montreal.....	Alamac.....	Dupuy Tp.
*Allied Mines Syndicate, Ltd.....	190 St. James St., Montreal.....		Clericy Tp.
*Aldermac Mines Ltd.....	603 Royal Bk. Bldg., Toronto.....	Aldermac.....	Boischatel Tp.
*Alderson and MacKay.....	921 New Birks Bldg., Montreal.....		Boischatel Tp.
*Amulet Mines, Ltd.....	120 St. James St., Montreal.....	Amulet.....	Rouyn Tp.
*Andean Copper Mines, Ltd.....	Blackburn Bldg., Ottawa.....		Boischatel Tp.
*Archean Mines Development Co.....	New Birks Bldg., Montreal.....	Archean.....	Clericy Tp.
*Arnfield Gold Mines, Ltd.....	921 New Birks Bldg., Montreal.....		Boischatel Tp.
*Armstrong Mines, Ltd.....	165 Main St., Hull.....		Boischatel Tp.
*Area Mines, Ltd.....	120 St. James St., Montreal.....	Area.....	Rouyn Tp.
*Astoria Rouyn Mines, Ltd.....	70 St. Paul St., Quebec.....		Rouyn Tp.
*Bellehumeur Mining Co., Ltd.....	Lorrainville.....	Bellehumeur.....	Lorrainville.
*Boischatel Mines, Ltd.....	Blackburn Bldg., Ottawa.....		Boischatel Tp.
*Bona Vista Mining Corporation.....	445 St. Francis Xavier St., Montreal.....		Destor Tp.
*Brownlee Gold Mines, Ltd.....	Rouyn.....		Rouyn Tp.
*Buffalo Rouyn Mines, Ltd.....	Royal Bk. Bldg., Toronto.....		Rouyn Tp.
*Canadian American Copper Refining Co., Ltd.....	87 Notre Dame St. E., Montreal.....		Eastman.
*Capital Rouyn Gold Mines, Ltd.....	Quebec.....	Capital Rouyn.....	Boischatel and Rouyn Tp.
*Chance Mining Co.....	1032 Dorchester St. W., Montreal.....		Boischatel Tp.
*Clericy Mines, Ltd.....	74 Sparks St., Ottawa.....	Clericy.....	Clericy Tp.
*Coniag Mines, Ltd.....	50 Ontario St., St. Catharines.....		Montbray and Duprat Tp.
Consolidated Copper and Sulphur Co.....	Eustis.....	Eustis.....	Ascot tp.
*Corona Mines, Ltd.....	126 St. Peter St., Quebec.....		Duprat and Dasseratt Tp.
*Dalquier Mining Co., Ltd.....	Amos.....		Dalquier Tp.
*Destor Mines, Ltd.....	St. James St., Montreal.....		Destor Tp.
*Don Rouyn Gold Mines, Ltd.....	14 Hospital St., Montreal.....		Rouyn Tp.
*Duparquet Copper Gold Syndicate.....	1106 C.P.R. Bldg. Toronto.....		Duparquet Tp.
*Duprat Mines, Ltd.....	126 St. Peter St., Quebec.....		Duprat and Montbray Tps. Kamiskotia Dist., Ont.
*Federal Investment Co.....	407 McGill St., Montreal.....		Dufresnoy Tp.
*Fisher Quebec Gold Mines, Ltd.....	75 Sun Life Bldg., Toronto.....		Landrienne Tp.
*Fisher Quebec Prospecting Syndicate.....	Fisher.....		Abitibi Co.
*Frontenac Copper Mines, Ltd.....	86 Notre Dame St. W., Montreal.....		Dufresnoy and Clericy Tp.
*Garwar Quebec Mining Co., Ltd.....	315 Confed. Life Bldg, Toronto.....		Desmeloizes Tp.
*Granada Rouyn Mining Co., Ltd.....	Rouyn.....		Rouyn Tp.
*Horne Copper Corporation.....	Noranda.....	Horne.....	Rouyn Tp.
*Harire Mining Co., Ltd.....	New Birks Bldg., Montreal.....	Harire.....	Clericy Tp.
*Heron, Chas. M.....	Box 287 Cobalt.....		Montbray and Dasseratt Tp.
Jay Copper-Gold Mines Ltd.....	76 Canada Life Bldg., Montreal.....		Dalquier Tp.
*Kegamion Dev. and Mining Co., Ltd.....	51 Sparks St., Ottawa.....		Royal-Roussillon Tp.
*Kenjoievis Syndicate.....	Temiskaming.....		Rouyn.
*Knox Wiltsey Syndicate.....	New Liskeard.....		Quebec.....
*Lake Dufault Syndicate.....	320 St. Denis St., Montreal.....		Dufresnoy Tp.
*Lake Duprat Mines, Ltd.....	402 Bay St., Toronto.....		Duprat Tp.
*Lake Maron Gold Mines, Ltd.....	404 Talbot St., London.....		Dasseratt Tp.
*La Mine d'Or Venus, Ltd.....	104 St. John St., Quebec.....		Barante Tp.
*La Reine Mine, Ltd.....	Amos.....		Desmeloizes Tp.
*Lartie Mining Corporation Ltd.....	603 Royal Bk. Bldg., Toronto.....		Malartic Tp.

*Operating but not producing.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
QUEBEC—Concluded			
*Laurier Mines Ltd.	120 St. James St., Montreal.		Dufresnoy Tp.
*Macat Mines Ltd.	Rouyn.		Dufresnoy Tp.
*Makamie Mines Que.	205 St. James St., Montreal.		Destor Tp.
*Malartic Gold Mines, Ltd.	503 Excelsior Life Bldg., Toronto.	Malartic.	Fournier Tp.
*Marclay Mines, Ltd.	10 Adelaide St. E., Toronto.		Boischatel Tp.
*McDougall Mines, Ltd.	503 Excelsior Life Bldg., Toronto.	McDougall.	Duprat Tp.
*Mineral Explorations Ltd.	1210 Bk. of Hamilton Bldg., Toronto.		Montbray Tp.
*Montreal Rouyn Mines, Ltd.	190 St. James St., Montreal.		Dufresnoy and Rouyn Tp.
*National Exploration & Holdings Co.	190 St. James St., Montreal.		Malartic and Fournier tp.
*Newbee Mines Ltd.	603 Royal Bk. Bldg., Toronto.		Dufresnoy Tp.
*Nipissing Mining Co. Ltd.	165 Broadway, New York.		Montbray Tp.
*Norman Mines, Ltd.	410 Blackburn Bldg., Ottawa.		Bearn and Dalquier Tp.
*Norrington Development Co., Ltd.	120 St. James St., Montreal.		La Sarre Tp.
*Norwesque Gold Mines, Ltd.	217 Bay St., Toronto.		Cadillac and Malartic Tp.
*Notre Dame Gold Mines, Ltd.	15A Notre Dame St. W., Montreal.		Montbray and Dufresnoy, Tp.
*O'Brien, M. J., Ltd.	816 Ottawa Electric Bldg., Ottawa.		Cadillac Tp.
*Oriole Mines, Ltd.	501 Continental Life Bldg., Toronto.		Montbray Tp.
*Osisko Rouyn Exploration Co., Ltd.	1154 Beaver Hall Sq. Montreal.		Rouyn Tp.
*Pioneer Mining Corporation, Ltd.	302 Bay St., Toronto.		Boischatel Tp.
*Porcupine Crown Mines, Ltd.	145 St. James St. Montreal.		Guyenne Tp.
*Quebec Copper Corporation Ltd.	165 Main St., Hull.		Boischatel Tp.
*Renault, August.	Ville Marie.		Dasserat Tp.
*Riada Rouyn Mines Ltd.	21 Richmond St. W., Toronto.		Dufresnoy Tp.
*Ribago Copper Corporation, Ltd.	Haileybury.		Boischatel Tp.
*Ste Anne Syndicate.	78 Manufacturers St., Montreal.		Abalski and McKenzie Tp.
*St. Anthony Gold Mines, Ltd.	255 Bay St., Toronto.		Montbray Tp.
*Siscoe Gold Mines, Ltd.	611 Keefer Bldg., Montreal.		Dubuissou Tp.
*Stadacona Rouyn Mines, Ltd.	120 St. James St., Montreal.		Rouyn.
*Thompson Cadillac Mines, Ltd.	217 Bay St., Toronto.		Cadillac Tp.
*Timmins, N. A., Incorporated.	1010 Canada Cement Bldg., Montreal.	Waite Montgomery.	Rouyn.
*Towagmac Exploration Co., Ltd.	921 New Birks Bldg., Montreal.		Boischatel Tp.
*United Copper Syndicate, Ltd.	190 St. James St., Montreal.		
*United Verde Extension Mining Co.	233 Broadway, New York.		Rouyn Tp.
*Volco Mines Co.	8 Sault-au-Matelot St., Quebec.		Malartic Tp.
*Vickers Mines, Ltd.	34 King St. E., Toronto 2.		Boischatel and Rouyn Tp.
*Ville Marie Mining Co.	Ville Marie.		Rouyn Tp.
*Waite-Ackerman-Montgomery Mines, Ltd.	604 Royal Bk. Bldg., Toronto.		Dufresnoy and Duprat tps.
*Wegial Mining Syndicate.	4 Hospital St., Montreal.		Joames Tp.
*Wickham Mining Co., Ltd.	South Durham.		Wickham Tp.
*Wiltsey-Coghlan Mines, Ltd.	217 Bay St., Toronto.		Rouyn Tp.
*Windfall Rouyn Mines, Ltd.	404 New Birks Bldg., Montreal.		Clericy Tp.
MANITOBA			
*Channing, R. H.	725 Standard Oil Bldg, San Francisco, Cal.	Flin Flon.	Flin Flon Lake.
*Eldorado Gold Mines, Ltd.	319 Bay St., Toronto.	Eldorado.	Central Manitoba.
*Sheritt Gordon Mines, Ltd.	614 Excelsior Life Bldg., Toronto.	Sheritt Gordon.	Cold Lake.
BRITISH COLUMBIA			
*Big Missouri Mining Co.	606 Perkins Bldg., Tacoma, Wash.	Big Missouri.	Portland Canal Mining Division.
Britannia Mining and Smelting Co., Ltd.	Britannia Beach.	Britannia.	Vancouver Mining Division.
Buena Vista Mining Co. (formerly Big Missouri Mining Co.)	308 Pacific Bldg., Vancouver.	Big Missouri.	Portland Canal Mining Division.
*Coast Copper Co. Ltd.	Trail.	Coast Copper.	Nanaimo Mining Division.
*Columario Gold Mines, Ltd.	33 Adelaide St. W., Toronto.	Valhalla Kleanza.	Omineca Mining Division.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.	Centre Star and Le Roi.	Rossland Mining Division.
*Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.	Independence.	Yale Mining Division.
		Spokane, Motherlode,	Clinton Mining Division.
		Mohawk, Tennessee,	
		George Copper.	Portland Canal Mining Division.
Continental Copper Co. Ltd. (formerly Kamloops Copper Co.).	Box 520 Kamloops.	Iron Mask.	Kamloops Mining Division.

* Operating but not producing.

DOMINION BUREAU OF STATISTICS

Copper-Gold-Silver Mining Industry—Concluded

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—Concluded			
Crowe-Swords, Robert.....	3638 2nd Ave. W. Vancouver..	Lucky Jim.....	Nanaimo Mining Division.
*D. W. Mines, Ltd.....	Cedarvale.....	D.W.....	Omineca Mining Division.
Emma Blue Bell.....	Eholt.....	Blue Bell.....	Grand Forks Mining Division.
Godfrey, John S.....	Box 322 Northport, Wash.....	Velvet Rossland.....	Trail Creek Mining Division.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Anyox.....	Hidden Creek, Golskeish, Outsider.....	Nass River Mining Division.
		Copper Mountain.....	Portland Canal Mining Division.
Harvey, C. G.....	Smithers.....	Harvey Gp.....	Similkameen Mining Division.
*Hecla Mining Co.....	Wallace, Idaho.....	Union & Maple Leaf....	Babine Mountain.
*Holdsworth, P. H.....	1827 L. C. Smith Bldg., Seattle, Wash.	White Elephant.....	Grand Forks Mining Division.
Midnight Leasing & Bond Co.....	Rossland.....	Midnight.....	Vernon Mining Division.
*Pitt Mining Co., Ltd.....	25 Hastings St. E., Vancouver.	Viking.....	West Kootenay.
*Revenue Mining Co., Ltd.....	818 Standard Bk. Bldg. Vancouver.	Western Copper.....	New Westminster Mining Division.
*Schulz, Paul H.....	Grand Forks.....	Union.....	Khutze Inlet.
*Stenbraten, John O.....	Box 55, Juneau, Alaska.....	Stampede.....	Kettle Valley District.
			Atlin Mining Division.

Iron Mining Industry

QUEBEC			
Baie St. Paul Titanic Iron Ore Co.....	Baie St. Paul.....		Baie St. Paul.
*Titanium Products Corporation.....	Parliament Bldgs., Quebec.....		St. Urbain Tp.

Molybdenum Mining Industry

QUEBEC			
Molybdenite Reduction Co., Ltd.....	66 St. James St., Montreal....		Lacorne Tp.

Nickel-Copper Mining Industry

ONTARIO			
International Nickel Co. of Canada, Ltd.	67 Wall St., New York.....	Creighton, Frood.....	Snider & McKinn Tp.
Mond Nickel Co., Ltd.....	Coniston.....	Garson Worthington Frood-Extension, Leack.	Garson, McKinn, Drury & Levack Tps.

*Operating but not producing.

Non-ferrous Smelting and Refining Industry

Name	Address	Location
QUEBEC		
Aluminium Co. of Canada, Ltd.....	Canada Life Bldg., Toronto 2.....	Arvida and Shawinigan Falls.
Horne Copper Corporation.....	Rouyn.....	Rouyn.
ONTARIO		
Deloro Smelting & Refining Co., Ltd.....	Deloro.....	Deloro.
International Nickel Co. of Canada, Ltd.....	67 Wall St., New York.....	Copper Cliff and Port Colborne.
Kingdon Mining, Smelting and Manufacturing Co., Ltd.....	1122 Beaver Hall Hill, Montreal.....	Galetta.
Mond Nickel Co., Ltd.....	Coniston.....	Coniston.
BRITISH COLUMBIA		
Consolidated Mining and Smelting Company of Canada, Ltd.....	Trail.....	Trail.
Granby Consolidated Mining, Smelting and Power Co., Ltd.....	Anyox.....	Anyox.

Silver-Cobalt Mining Industry

Name	Address	Name of Mine	Location
ONTARIO			
Aladdin Cobalt Co., Ltd.....	New Liskeard.....	Aladdin.....	Coleman Tp.
Canadian Lorrain Silver Mines, Ltd.....	302 Bay St., Toronto.....	Canadian Lorrain.....	South Lorrain Tp.
*Casey Mountain Syndicate.....	842 Yonge St., Toronto.....	Casey Mountain.....	Casey Tp.
Castle-Tretheway Mines, Ltd.....	603 Standard Bank Bldg., Toronto.....	Castle Tretheway.....	Haultain Tp.
Cobalt Contract Mines, Ltd.....	8 Bloor St. E., Toronto.....	Cobalt Contract.....	Bucke Tp.
*Coleroy Mining Co., Ltd.....	272 Bay St., Toronto.....	Coleroy.....	Nicol Tp.
Frontier (Lorrain) Mines, Ltd.....	Bank of Hamilton Bldg., Toronto.....	Frontier Lorrain.....	Silver Centre.
Hudson Bay Mines, Ltd.....	New Liskeard.....	Hudson Bay.....	Cobalt.
Keeley Silver Mines, Ltd.....	302 Bay St., Toronto.....	Keeley.....	South Lorrain Tp.
Kerr Lake Mining Co., Ltd.....	61 Broadway, New York, N.Y.....	Kerr Lake.....	Coleman.
*Kirk Budd Mining Co., Ltd.....	Cobalt.....	Kirk Budd.....	Cobalt.
Lorrain Trout Lake Mines, Ltd.....	36 King St. E., Toronto.....	La Rose.....	Coleman Tp.
	Bank of Hamilton Bldg., Toronto.....	Lorrain Trout Lake.....	Silver Centre.
McKinley-Darragh-Savage Mines Cobalt, Ltd.....	Cobalt.....	McKinley-Darragh.....	Coleman Tp.
*Millerest Mining Co., Ltd.....	204 McKinnon Bldg., Toronto.....	Millerest.....	Haultain Tp.
Mining Corporation of Canada, Ltd.....	Bank of Hamilton Bldg., Toronto.....	Buffalo, Townsite City, Cobalt Lake.....	Coleman Tp.
Nipissing Mining Co., Ltd.....	Cobalt.....	Nipissing.....	Coleman Tp.
*Nipissing Mining Co., Ltd.....	Cobalt.....	Nipissing Lorrain.....	Lorrain Tp.
O'Brien, M. J., Ltd.....	Cobalt.....	O'Brien (Miller Lake O'Brien).....	Coleman Tp.
Peterson Cobalt Mines, Ltd.....	Royal Bank Bldg., Toronto.....	Peterson Lake.....	Gowganda.
Reinhardt, Carl.....	Box 303, Cobalt.....	Crown Reserve.....	Coleman Tp.
Sandoe and Moyle.....	Box 815, Cobalt.....	Penn Canadian.....	Coleman Tp.
Strong, Horace F.....	Bk. of Nova Scotia Bldg., Montreal.....	Wettlaufer.....	South Lorrain.
Tonopah Canadian Mines Co.....	Bullitt Bldg., Philadelphia, Pa.....	Tonopah Canadian.....	Gowganda.
Wabi Iron Works, Ltd.....	New Liskeard.....		Cobalt.

* Operating but not producing.

Silver-Lead-Zinc Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
British Metals Corporation, Ltd.....	263 St. James St., Montreal...	Sterling.....	Richmond Co.
QUEBEC			
British Metals Corporation Ltd.....	263 St. James St., Montreal...	Tetreault.....	Montauban Tp.
*Federal Zinc and Lead Co., Ltd.....	602 Drummond Bldg., Mont- real.	Federal.....	Lemieux Tp.
*Lyall and Beidelman.....	602 Drummond Bldg., Mont- real.		Lemieux Tp.
*Pioneer Mining Corporation, Ltd.....	302 Bay St., Toronto.		
*St. Lawrence Zinc and Lead Mines, Ltd.	205 St. James St., Montreal...	Thibeault.....	Montauban Tp.
ONTARIO			
*Interprovincial Exploration Co., Ltd....	263 St. James St., Mont-real...		McVittie Tp.
Kingdon Mining, Smelting and Manu- facturing Co., Ltd.	1122 Beaver Hall Hill, Mont- real.	Kingdon.....	Galetta.
*North American Lead and Refining Co., Ltd.	145 St. James St., Montreal...	Ogema.....	Dorion Tp.
*Treadwell Yukon Co., Ltd.....	1018 Crocker Bldg., San Fran- cisco, California.	Errington.....	Balfour and Creighton Tp.
BRITISH COLUMBIA			
<i>Ainsworth Mining Division—</i>			
Caledonia Mine.....	Zineton.....	Caledonia.....	Ainsworth.
Consolidated Mining and Smelting Company of Canada, Ltd.	Trail.....	Highland.....	Ainsworth.
Daybreak Mining Co., Ltd.....	309 Wilcox Bldg., Portland Oregon.	Gibson.....	Ainsworth.
Delpretto and Currie.....	Ainsworth.....	Banker.....	Ainsworth.
Fowler and Eastman.....	Riondel.....	Bluebell.....	Riondel.
Gregerich, H.....	Kaslo.....	Montezuma.....	Kaslo Creek.
Kennedy, Hawkins and Hughes.....	Ainsworth.....	Silver Hoard.....	Ainsworth.
Metals Recovery, Ltd.....	Kaslo.....	Monte Christo.....	Ainsworth.
Myers, Wm. and Johnson, Geo.....	Kaslo.....	Lavina.....	Ainsworth.
Nordman, Edward.....	Beaverdell.....	Whitewater.....	Retallack.
Whitewater Mines, Ltd.....	Kaslo.....		
<i>Atlin Mining Division—</i>			
Atlin Silver Lead Mines.....	Atlin.....	Ruffner.....	Atlin.
<i>Fort Steele Mining Division—</i>			
Aurora Syndicate.....	Newgate.....	Aurora.....	Fort Steele.
Consolidated Mining and Smelting Company of Canada Ltd.	Trail.....	Sullivan Mine and St. Eugene Mill.	Moyie.
Guindon Mining and Milling Co., Ltd..	Moyie.....	Guindon.....	Moyie.
<i>Golden Mining Division—</i>			
Anderson, L. E.....	Golden.....	Golden.....	Golden.
Galena Syndicate, Ltd.....	Box 132 Golden.....	Ruth Vermont.....	Vermont Creek.
<i>Grand Forks Mining Division—</i>			
Lightning Peak Mining Co.....	Edgewood.....	Lightning Peak.....	Kettle River.
<i>Greenwood Mining Division—</i>			
Bounty Mines.....	Beaverdell.....	Bounty.....	Wallace Mountain.
Duhamel, J. H.....	Box 543 Greenwood.....	Crescent.....	Greenwood.
Inyo-Ackworth Mines, Ltd.....	411 Pender St. Vancouver.	Inyo-Ackworth.....	Greenwood.
McDonell, Jerome.....	Box 483 Greenwood.....	Providence.....	Greenwood.
McIntosh and Lee.....	Beaverdell.....	Bell.....	Wallace Mountain.
Sally Mines, Ltd.....	Box 220 Penticton.....	Sally.....	Wallace Mountain.
Wauke, Edward.....	Greenwood.....	Enterprise.....	Greenwood.
Wellington Syndicate.....	Greenwood.....	Wellington.....	Beaverdell.
<i>Kamloops Mining Division—</i>			
Bell, W. L.....	Box 341 Kamloops.....	Homestake.....	Kamloops.
<i>Lardeau Mining Division—</i>			
Multiplex Mining, Milling and Power Co., Ltd.	Beaton.....	Multiplex.....	Lardeau.
<i>Nass River Mining Division—</i>			
Alice Arm, La Rose Mfg. Co., Ltd....	Prince Rupert.....	La Rose.....	Nass River.
Fiva, J.....	Alice Arm.....	Wolf.....	Alice Arm.
<i>Nelson Mining Division—</i>			
Consolidated Mining and Smelting Company of Canada, Ltd.	Trail.....	Hunter V.....	Nelson.
Constable, Guy.....	Creston.....	Alice.....	Creston.
Goodenough Mines, Ltd.....	Nelson.....	Goodenough.....	Ymis.
Horton, P.F. et al.....	Salmo.....	Hudson Bay.....	Salmo.
Molander, Andy.....	Trail.....	Molly Gibson.....	Nelson.
Yankee Girl, Ltd.....	Ymir.....	Yankee Girl.....	Ymir.
<i>Omineca Mining Division—</i>			
Duthie Mines, Ltd.....	Box 1837 Seattle, Wash.....	Duthie.....	Hudson Bay Mountain.
<i>Portland Canal Mining Division—</i>			
B.C. Bonanza Mines, Ltd.....	Stewart.....	B.C. Bonanza.....	Salmon River.
Dunwell Mines, Ltd.....	Stewart.....	Dunwell.....	Glacier Creek.
Porter-Idaho Mining Co., Ltd.....	Stewart.....	Porter-Idaho.....	Glacier Creek.
Silverado Mines, Ltd.....	101 Pemberton Bldg., Victoria	Silverado.....	Bear River.

* Operating but not producing.

Silver-Lead-Zinc Mining Industry—Concluded

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—Continued			
<i>Revelstoke Mining Division—</i> Snowflake Mining Co., Ltd.	418 Standard Bk. Bldg., Vancouver.	Snowflake	Albert Canyon.
<i>Similkameen Mining Division—</i> Jensen, Andy	Tulameen	Eureka	Similkameen.
Lade Bros.	24—7th Ave., Vancouver	Renfrew	Siwash Creek.
<i>Slocan Mining Division—</i> American Boy Mining Co.	Box 171 Sandon.	American Boy	Sandon.
Antoine Cons. Mines.	Box. 122 Kaslo.	Antoine	Sandon.
Bigelow Bay Mining Syndicate	New Denver	Molly Hughes	New Denver.
Black, H. and Heggins, C.	Sandon	Red Fox	Sandon.
Brandon, J.	Sandon	Canadian	Sandon.
Cechelero, J., Beber, J. and Zattoni, M.	New Denver	Mountain Chief	New Denver.
Cunningham Mines, Ltd.	Alamo	(Alamo, Van Roi. Wonderful, Queen Bess.	Sandon. Sandon.
Gormley, L. P.	Alamo	Dore	Three Forks.
Hall and White.	331 Summit Ave., Pasadena, California.	Colonial	Sandon.
Johnson and Matthews	Silverton.	Galena Farm.	Silverton.
Lincoln, Paul	Sandon	Noble Five	Sandon.
Lucky Jim Lead and Zinc Co., Ltd.	605 Empire State Bldg., Spokane, Wash.	Lucky Jim	Zincton.
MacAulay, A. S.	Silverton.	Metallic	Silverton.
Petty Geo. A.	Sandon.	Victor	Sandon.
Porcupine Goldfields Development and Finance Co., Ltd.	Kimberley	Mammouth	Silverton.
Rambler, Cariboo Mines, Ltd.	Kaslo	Rambler-Cariboo	Slocan.
Roseberry Surprise Mining Co., Ltd.	New Denver	Bosun, Surprise, Monitor	Sandon, Three Forks.
Ruth Hope Mining Co., Ltd.	Kaslo	Ruth Hope	Sandon.
Silversmith Mines, Ltd.	Sandon	Silversmith	Sandon.
Slocan King Mines, Ltd.	Sandon	Hidden Treasure	Sandon.
Stratton, Svenson and Olson	Sandon	Mountain Con.	Sandon.
Victoris Syndicate, Ltd.	Box 122 Kaslo	(Hewitt Minnie Ha! Ha! and Carnation	Silverton. Sandon.
Wragge, E. C. and Maguire, P.	Nelson	Enterprise	Slocan.
<i>Vernon Mining Division—</i> St. Paul Mines, Ltd.	925 Rogers Bldg., Vancouver.	St. Paul	Vernon.
<i>Windermere Mining Division—</i> Forster, H. E.	Wilmer.	B.C. and Tillbury	Wilmer.
Lead Queen Mine	Brisco	Lead Queen	Frances Creek.
Victoria Syndicate, Ltd.	Kaslo	Paradise	Invermere.
YUKON			
Gordon and Moreau	Keno City	Whipsaw Claim	Sourdough Hill.
Johnson, Andy	Mayo	Ram	Sourdough Hill.
Keno Hill, Ltd.	120 Broadway, New York.	Keno Hill	Mayo Division.
Rasmussen, Rodolph	Keno Hill	Silver Basin	Keno Hill.
Treadwell Yukon Co., Ltd.	1022 Crocker Bldg., San Francisco, California.	Treadwell Yukon	Mayo Division.

Tungsten Mining Industry

NOVA SCOTIA			
*Indian Path Gold Prospecting Syndicate.	Box 314 Halifax	Indian Path	Lunenburg Co.

NON-METAL MINING INDUSTRIES INCLUDING FUELS

FUELS

Coal Mining Industry

Name	Address	Location
NOVA SCOTIA—		
Acadia Coal Co., Ltd.	Stellarton	District— Pictou.
Boston Coal Co.	River Hebert	Cumberland.
Bras d'Or Coal Co.	Little Bras d'Or Bridge	Cape Breton.
Canadian Coal Co., Ltd.	Halifax	Cumberland.
Carter Coal Co.	Maccan	Cumberland.
Cumberland Ry. and Coal Co.	Glace Bay	Cumberland.
Dominion Coal Co., Ltd.	Glace Bay	Cape Breton.
Enterprise Coal Co., Ltd. (formerly Lawson Coal Co.)	Maccan	Cumberland.
Greenwood Coal Co., Ltd.	Thorburn	Pictou.
India Cove Coal Co., Ltd.	Sydney Mines	Cape Breton.
Intercolonial Coal Mining Co., Ltd.	Westville	Pictou.
Inverness Railway and Coal Co.	Inverness	Inverness.
Maritime Coal, Railway and Power Co., Ltd.	Joggins Mines	Cumberland.
Nova Scotia Steel and Coal Co.	Sydney Mines	Cape Breton.
Phoenix Coal Co., Ltd.	Amherst	Cumberland.
River Hebert Coal Co.	River Hebert	Cumberland.
Standard Coal Co. (formerly Emmerson Coal Co. Ltd.)	River Hebert	Cumberland.
Victoria Coal Co. Ltd. (operating No. 2 Mine, Minudie Coal Co.)	River Hebert	Cumberland.
NEW BRUNSWICK—		
Avon Coal Co., Ltd.	St. John	County— Queens.
Black Diamond Co.	Minto	Queens.
Burpee Construction Co.	Devon	Queens.
Evans, W. B. (formerly Rothwell Coal Co., Ltd.)	Rothwell	Queens.
Minto Coal Co., Ltd.	St. John	Queens.
Miramichi Lumber Co., Ltd.	Minto	Queens.
Welton, Harvey	Minto	Sunbury.
Welton & Henderson	Minto	Queens.
SASKATCHEWAN—		
Bienfait Mine	Bienfait	Municipality— Near Bienfait.
Big Lump Coal Co. (formerly Bourguin & Smith)	Estevan	Near Estevan.
Bourguin, Louis	Estevan	Cascade.
Crescent Collieries, Ltd.	Bienfait	Near Estevan.
Eastern Collieries of Bienfait, Ltd.	Estevan	Near Bienfait.
International Clay Products, Ltd.	Estevan	Near Estevan.
Lignite Coal Mines, Ltd. (formerly Andrew A. Miller)	Taylorlton	Near Estevan.
Manitoba and Saskatchewan Coal Co., Ltd.	503 Avenue Block, Winnipeg, Man.	Taylorlton.
Parkinson, Geo.	Estevan	Bienfait.
Shand Coal and Brick Co.	Shand	Near Estevan.
Western Dominion Collieries, Ltd.	305 Trust and Loan Building, Winnipeg, Man.	Shand.
ALBERTA—		
Bituminous—		
Blue Diamond Coal Co., Ltd.	602 Standard Bank Bldg., Toronto, Ont.	District— Brule.
Brazeau Collieries, Ltd.	Nordegg	Nordegg.
Cadomin Coal Co., Ltd.	282 Main St., Winnipeg, Man.	Mountain Park.
Canmore Coal Co., Ltd.	Canmore	Cascade.
Hillcrest Collieries, Ltd.	Hillcrest	Crowsnest.
International Coal and Coke Co., Ltd.	Coleman	Crowsnest.
Luscar Collieries, Ltd.	410 Tegler Bldg., Edmonton	Mountain Park.
McGillivray Creek Coal and Coke Co., Ltd.	Coleman	Crowsnest.
Mohawk Bituminous Mines, Ltd.	515 Lancaster Bldg., Calgary	Crowsnest.
Mountain Park Collieries, Ltd.	708 Tegler Bldg., Edmonton	Mountain Park.
Pass Bituminous Collieries, Ltd.	Burnis	Crowsnest.
West Canadian Collieries, Ltd.	Blairmore	Crowsnest.
Sub-Bituminous—		
Alexo Coal Co., Ltd.	Alexo	Saunders.
Bighorn and Saunders Creek Collieries, Ltd.	Saunders	Saunders.
Bryan Coal Co., Ltd.	Adams Bldg., Edmonton	Coalspur.
Coal Valley Mining Co., Ltd.	806 McLeod Bldg., Edmonton	Coalspur.
Confederation Coal Co., Ltd. (formerly Northern Alberta Mines, Ltd.)	104 C.P.R. Building, Edmonton	Coalspur.
Elkhead Collieries, Ltd. (formerly Reco Hard Coal Co.)	Reco	Coalspur.
Foothills Collieries, Ltd.	222 Portage Ave., Winnipeg, Man.	Coalspur.
Saunders Ridge Coal Co., Ltd.	Merc coal	Coalspur.
Saunders West Collieries, Ltd. (formerly Stanley, C. H.)	West Saunders	Saunders.
Sterling Collieries, Ltd.	911 McLeod Bldg., Edmonton	Coalspur.

Coal Mining Industry—Continued

Name	Address	Location
<i>ALBERTA—Continued</i>		
<i>Lignite—</i>		
Ajax Coal Co., Ltd.	Medicine Hat	District
Alberta Block Coal Co., Ltd.	Drumheller	Redcliff.
Anderson, W. J.	Sheerness	Drumheller.
Atlas Coal Co., Ltd.	Drumheller	Sheerness.
Banner Coal Co., Ltd., (formerly National Col- lieries, Ltd.)	Round Hill	Drumheller.
Bay Coal Co., Ltd.	Taber	Camrose.
Big Valley Collieries, Ltd.	Big Valley	Taber.
Big Valley Power and Mining Co., Ltd. (former- ly Griffith & Scott)	Calgary	Big Valley.
Caledonian Collieries, Ltd.	Drumheller	Drumheller.
Canadian Coal Co., Ltd.	206 Quebec Bldg., Edmonton.	Edmonton.
Canadian Dinant Coal Co.	Dinant	Camrose.
Canadian Pacific Railway Co.	Department of Natural Resources, Calgary	Lethbridge, Taber.
Cardiff Coal Co. (formerly Davidson, Mrs. A. J.)	5650 Ada Blvd., Edmonton.	Edmonton.
Chappell Coal Co., Ltd.	Tofield	Tofield.
City of Lethbridge Coal Mines	Lethbridge	Lethbridge.
Consolidated Diamond Collieries, Ltd.	Lethbridge	Lethbridge.
Co-Operative Coal Co.	Barnwell	Taber.
Craig Coal Co., Ltd.	Drumheller	Drumheller.
Dawson Coal Co., Ltd.	7 McDougall Court, Edmonton.	Edmonton.
Dobell Coal Co., Ltd.	138 St. Peter St., Quebec, P.Q.	Tofield.
Donaldson, C. S. Coal Co.	Suite 1, Hill Block, Lethbridge.	Lethbridge.
Elgin Coal Co., Ltd.	Drumheller	Drumheller.
Ellis Coal Co., Ltd.	Box 46, Three Hills	Carbon.
Excelsior Collieries, Ltd.	Wayne	Drumheller.
Fox Coal Co. (formerly Carbon Gem Mine)	Carbon	Carbon.
Fraser-McKay Collieries, Ltd.	10055-101st St., Edmonton	Edmonton.
Great West Coal Co., Ltd. (Black Diamond Mine)	11026-101st Ave., Edmonton	Edmonton.
Great West Coal Co. Ltd. (Star Mine)	Aerial	Drumheller.
Hy-Grade Coal Co.	Drumheller	Drumheller.
Ideal Coal Co., Ltd.	Wayne	Drumheller.
Jewel Collieries, Ltd.	Wayne	Drumheller.
Keith & Fulton Coal Co., Ltd.	Clover Bar	Edmonton.
Kleenburn Collieries, Ltd.	Eyremore	Brooks.
Lakeside Coals, Ltd.	711 Tegler Bldg., Edmonton	Pembina.
Leland Coal Co., Ltd. (formerly Majestic Collieries, Ltd.)	Taber	Taber.
Marcus Coal Mines, Ltd.	10366-104th St., Edmonton	Edmonton.
McLenhan, John A. and Co. (formerly Spicer Coal Co., Ltd.)	Dinant	Camrose.
Midland Coal Mining Co., Ltd.	Midlandvale	Drumheller.
Mid-West Collieries, Ltd.	Drumheller	Drumheller.
Newcastle Coal Co., Ltd.	Drumheller	Drumheller.
New Castle Junior Mining Co.	Drumheller	Drumheller, Lethbridge.
North American Collieries, Ltd.	909 Lancaster Bldg., Calgary	Pembina.
Oliphan, J. H.	Carbon	Carbon.
Ontalta Collieries, Ltd. (formerly Capital Collieries, Ltd.)	Rosedale Station	Drumheller.
Ottewell Coal Co.	Clover Bar	Edmonton.
Palisade Coal Co.	Three Hills	Carbon.
Peerless Carbon Coal Mines Ltd. (Consolidated with Peerless Carbon Collieries, Ltd.)	Carbon	Carbon.
Penn Mine Coal Co., Ltd. (formerly Crown Coal Co.)	10651-92nd St., Edmonton	Edmonton.
Penn Mines, Ltd. (formerly Edmonton Collier- ies, Ltd.)	Fraser Flats, Edmonton	Edmonton.
Premier Coal Co., Ltd. (formerly Reed and Brown)	109th Avenue, Edmonton	Edmonton.
Redcliffe Brick and Coal Co., Ltd.	Redcliffe	Redcliffe.
Rosedale Coal Co., Ltd.	Rosedale	Drumheller.
Rose Deer Coal Mining Co., Ltd.	Wayne	Drumheller.
Royal Lethbridge Collieries	Lethbridge	Lethbridge.
Shannon Coal Co., Ltd.	Carbon	Carbon.
Sovereign Coal Mining Co., Ltd. (formerly Western Commercial Co., Ltd.)	Wayne	Drumheller.
Stoney Creek Collieries, Ltd.	Camrose	Camrose.
Sturgeon Valley Collieries, Ltd.	Carbondale	Edmonton.
Sun Coal Co., Ltd. (formerly North Star Coal Co.)	Cardiff	Edmonton.
Sunbeam Coal Co., Ltd. (formerly Challenger Coal Co., Ltd.)	Ardley	Ardley.
Superior Grade Coal Co., Ltd.	Wayne	Drumheller.
Thomas, J. D., Coal Co.	Nacmine	Drumheller.
Tofield Coal Co., Ltd.	Tofield	Tofield.
Walsh, W. R. (formerly Parker Creek Col- lieries, Ltd., also Ardley Hardite Collieries, Ltd.)	Ardley	Ardley.
Warneboldt, Julius	Sheerness	Sheerness.
Western Gem Coal Co., Ltd.	Drumheller	Drumheller.

Coal Mining Industry—Concluded

Name	Address	Location
BRITISH COLUMBIA—		
Canadian Collieries (Dunsmuir), Ltd.	600 Belmont Bldg., Victoria	Island.
Coalmont Collieries, Ltd.	Coalmont	Inland.
Corbin Coals, Ltd.	Corbin	Crow's Nest Pass.
Crow's Nest Pass Coal Co.	Fernie	Crow's Nest Pass.
East Wellington Coal Co.	600 Belmont House, Victoria	Island.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Cassidy	Island.
Keystone Coal Co., Ltd.	Merritt	Inland.
Middlesboro Collieries, Ltd.	Middlesboro	Inland.
Tulameen Valley Coal Mine	Princeton	Inland.
Western Fuel Corporation of Canada, Ltd.	Nanaimo	Island.

Natural Gas Industry

NEW BRUNSWICK—		
New Brunswick Gas and Oilfields, Ltd.	Box 196, Moncton	Stoney Creek, Albert Co.
ONTARIO—		
Allen, J. D.	Lowbanks	Moulton.
Beer, Geo.	Binbrook	Binbrook.
Benn, A. S.	Hagersville	Walpole.
Binbrook Gas Co.	Binbrook	Binbrook.
Border Cities Syndicate	47 Elgin St., Brantford	Onondaga.
Canada Cement Co., Ltd.	Box 29, Montreal, P.Q.	Wainfleet.
Canby, B. F.	R.R. No. 2, Wainfleet	Wainfleet.
Canboro Gas and Oil Co.	Selkirk	Canboro, Cayuga N. and Seneca
Canfield Natural Gas Co.	Canfield	Cayuga N.
Castle Oil and Gas Co.	Imperial Bank Chambers, Niagara Falls	Euphemia.
Chippawa Development Co. Ltd.	Chippawa	Willoughby.
Cliff Gas Co.	Welland	Moulton, Canboro.
Coleman, J. A.	Wellandport	Wainfleet and Gainsboro.
Dominion Natural Gas Co., Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Bayham, Binbrook, Caistor, Canboro, Cayuga N., Cayuga S. Charlotteville, Dunn, Glanford, Houghton, Malahide Middleton, Moulton, Oneida, Onondaga, Rainham, Seneca, Townsend, Walpole, Walsingham N., Walsingham S., Windham, Woodhouse.
Dunn Natural Gas Co., Ltd.	Dunnville	Dunn and Sherbrooke.
Eastside Gas Co.	R.R. No. 2, Lowbanks	Sherbrooke.
Ellsworth, F.	Box 391, Pt. Colborne	Wainfleet.
Erie Gas and Oil Syndicate	Fisherville	Rainham.
Fisherville Gas Co.	Fisherville	Rainham.
Fletcher, J. D.	R.R. No. 1, Hannon	Binbrook.
Hart and Harrington	Dunnville	Canboro.
Held, Fred.	R.R. No. 2, Fisherville	Rainham.
Hill, A. W.	Coatsworth	Tilbury E.
Hoffman, Albert	R.R. No. 2, Dunnville	Moulton.
Industrial Natural Gas Co., Ltd.	Thorold	Bertie Crowland, Humberstone
Jasperson, B.	Kingsville	Cosfield South and Tilbury East.
Jones, J. S.	Port Maitland	Dunn.
Kindy, D. and Son	Selkirk	Rainham.
Lawson, J. J., Mrs.	R.R. No. 1, Lowbanks	Moulton.
Lincoln Gas Co., Ltd.	Grimsby	Gainsboro, Canboro, Caistor.
Marshall, Jas.	Hamilton	Glanford, and Seneca.
Medina Natural Gas Co. Ltd.	215 King St. W., Chatham	Bayham, Houghton and Middleton.
Michener, E. L.	Wainfleet	Wainfleet.
Midfield Gas Co., Ltd.	421 King St. E., Hamilton	N. Cayuga and Oneida.
Nelles Corners Gas Syndicate	Nelles Corners	Cayuga N. and Rainham.
New Azoff Gas Co., Ltd.	Canboro	Cayuga N.
Niece, Hosea and Son	R.R. No. 2, Lowbanks	Sherbrooke.
Northern Gas and Gasoline Co.	Hepworth	Anabel.
North Shore Gas Co. Ltd.	Selkirk	Rainham.
Oil Springs Oil and Gas Co., Ltd.	Oil Springs	Enniskillen.
Ontario Government	University of Toronto, Toronto	Caledon W.
Patterson, W. C.	Jamestown, N.Y., U.S.A.	Cayuga N., Cayuga S., and Dunn.
Petrol Oil and Gas Co., Ltd.	301 York Bldg., Toronto	Dover West.
Pilkington Bros. (Canada) Ltd.	17 Mercer St., Toronto, 2	Crowland.
Port Colborne-Welland Natural Gas and Oil Co., Ltd.	Port Colborne	Oneida, Onondaga and Seneca.
Provincial Natural Gas and Fuel Co. of Ontario, Ltd.	103 Queen St., Niagara Falls	Bertie, Crowland, Humberstone and Willoughby.

Natural Gas Industry—Concluded

Name	Address	Location
ONTARIO—Concluded		<i>Field</i>
Rainham Gas and Oil Syndicate.....	Fisherville.....	Rainham.
Root, Mrs. Esther.....	Dunnville.....	Cayuga S.
Sarnia Gas and Oil Co.....	145½ Front St., Sarnia.....	Sarnia.
Smith, R. H.....	Lowbanks.....	Moulton.
Southern Ontario Gas Co., Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Mersea, Raleigh, Romney and Tilbury East.
South Cayuga Gas and Oil Syndicate.....	Cayuga.....	Cayuga S.
South Sarnia Properties, Ltd.....	Sarnia.....	Sarnia.
Sparham, A. F.....	R.R. No. 1, Caledonia.....	Glanford.
Springvale Gas and Oil Co., Ltd.....	Hagersville.....	Walpole.
Sterling Gas Co., Ltd.....	Port Colborne.....	Humberstone, Moulton, Sher- brooke and Wainfleet.
Stevensville Natural Gas and Fuel Co. Ltd.....	Stevensville.....	Bertie.
Sundry Gas Well Co.....	Dunnville.....	Canboro.
Union Natural Gas Co. of Canada, Ltd.....	48½ Market St., Chatham.....	Dawn, Dover W., Raleigh, Romney, and Tilbury E.
United Gas Companies, Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Canboro, Cayuga N., Moulton, Seneca and Wainfleet.
Vacuum Gas and Oil Co., Ltd.....	701 Federal Bldg., Toronto.....	Middleton.
Van Sickle, A. W.....	Onondaga.....	Onondaga.
Wainfleet-Moulton Gas Co.....	R.R. No. 1, Lowbanks.....	Moulton and Wainfleet.
MANITOBA—		
Bosc, Francois.....	Rathwell.....	Rathwell.
Haskill, E. C.....	Box 64, Treherne.....	Treherne.
ALBERTA—		
Alberta Clay Products Co. Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
British Petroleum, Ltd.....	317 Bower Bldg., Vancouver, B.C.....	Wainwright.
Canada Cement Co., Ltd.....	Canada Cement Co. Bldg., Montreal, P.Q.....	Dauntless.
Canadian Pacific Railway Co.....	Montreal, P.Q.....	Medicine Hat.
Canadian Western Natural Gas, Light, Heat and Power Co., Ltd.....	215-6th Ave. W., Calgary.....	Bow Island and Foremost.
Canadian Western Power and Fuel Co., Ltd.....	Redcliff.....	Redcliff.
Dalhousie Oil Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Dominion Glass Co. Ltd.....	1111 Beaver Hall Hill, Montreal, P.Q.....	Redcliff.
Edmonton-Wainwright Oils, Ltd.....	Wainwright.....	Wainwright.
Footfalls Oil and Gas Co., Ltd.....	56 Church St., Toronto, Ont.....	Turner Valley.
Hedley-Shaw Milling Co., Ltd.....	Medicine Hat.....	Medicine Hat.
Higgins, W. F.....	Suffield.....	Suffield.
Maple Leaf Oil Co.....	514 Rogers Bldg., Vancouver, B.C.....	Many Island Field Fabyan- Wainwright.
McLeod Oil Co., Ltd.....	507 Grain Exchange, Calgary.....	Turner Valley.
Medicine Hat, Corporation of.....	Medicine Hat.....	Medicine Hat.
Northwestern Utilities, Ltd.....	10305 Jasper Ave., Edmonton.....	Viking.
Ogilvie Flour Mills Co., Ltd.....	Medicine Hat.....	Medicine Hat.
Redcliff Brick and Coal Co., Ltd.....	Box B5, Redcliff.....	Redcliff.
Royalite Oil Co., Ltd.....	602-2nd St. W., Calgary.....	Turner Valley.
Town of Bow Island.....	Bow Island.....	Bow Island.
United Electric and Engineering Co., Ltd.....	721-11th St. W., Calgary.....	Bassano.
United Natural Gas Development Co., Ltd.....	200-203 Leeson-Lineham Block, Cal- gary.....	Foremost.
Vulcan Oils Ltd.....	Vulcan.....	Turner Valley.
Wainwright Gas Co. Ltd.....	36 Dominion Bank Bldg., Edmonton.....	Distributing Company.)
Wetaskiwin, Corporation of.....	Wetaskiwin.....	Wetaskiwin.

Petroleum Industry

NEW BRUNSWICK—		<i>Field</i>
New Brunswick Gas and Oil Fields, Ltd.....	Box 196, Moncton.....	Stoney Creek, Albert County.
ONTARIO—		
Ajax Oil & Gas Co. Ltd.....	85 Richmond St. W., Toronto.....	Thamesville.
Anderson Bros. & Thompson.....	Oil Springs.....	Oil Springs.
Anderson, J. H.....	Oil Springs.....	Oil Springs.
Armstrong, J. E.....	Petrolia.....	Petrolia and Enniskillen.
Atkinson, John.....	R.R. No. 3, Petrolia.....	Petrolia and Enniskillen.
Bailey, John.....	Petrolia.....	Moore.
Barrett, C. H.....	Petrolia.....	Enniskillen.
Bennett, C. A.....	Cainsville.....	Onondaga.
Bowles, Herbert.....	Petrolia.....	Sarnia.
Bradley, R. N.....	Lowbanks.....	Petrolia and Enniskillen.
Brock, Thos. A.....	Petrolia.....	Petrolia and Enniskillen.
Buck, G. L. (Bothwell Oil Co.).....	Bothwell.....	Bothwell.
Buller, Robert.....	Petrolia.....	Petrolia and Enniskillen.
Byers, Lydia (Executrix).....	Oil Springs.....	Oil Springs.
Canada Crude Oil Producers, Ltd.....	Petrolia.....	Petrolia and Enniskillen.
Canadian Oil Refineries, Ltd.....	Toronto.....	Petrolia and Enniskillen.
Carleton, W. G.....	R.R. No. 2, Petrolia.....	Petrolia and Enniskillen.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—Concluded		<i>Field</i>
Carman and Fairbank.....	Petrolia.....	Bothwell.
Chesher, Geo.....	Petrolia.....	Sarnia.
Colchester Oil and Gas Co.....	Federal Bldg., Toronto.....	Thamesville.
Crocker-Parks Oil Co. Ltd.....	Oil Springs.....	Oil Springs.
Crotty and Elliott.....	Bothwell.....	Bothwell.
Deacon, F. W.....	Petrolia.....	Petrolia and Enniskillen.
Dennis, C.....	Oil Springs.....	Oil Springs.
Dennis, E.....	Petrolia.....	Plympton.
Dominion Cannery Ltd.....	Hamilton.....	Onondaga.
Dominion Petroleum Co., Ltd.....	Glencoe.....	Mosa.
Donald, Geo.....	Oil Springs.....	Oil Springs.
Drope, Geo.....	Petrolia.....	Petrolia and Enniskillen
Duncan Bros.....	Petrolia.....	Moore.
Eagle Oil & Gas Co., Ltd.....	35 Richmond St. W., Toronto.....	Thamesville.
Edward, F. H.....	Petrolia.....	Petrolia and Enniskillen.
Elliott, C. H.....	Corunna.....	Sarnia.
Elliott, Henry.....	Petrolia.....	Moore.
Fairbank, C. O. Estate.....	Petrolia.....	Bothwell.
Fairbank, J. H., Estate.....	Petrolia.....	Oil Springs.
Font, M.....	Petrolia.....	Moore.
Forsythe, A.....	Copelston.....	Petrolia and Enniskillen.
George, Wm.....	Oil Springs.....	Oil Springs.
Gillespie, Wm.....	Petrolia.....	Petrolia and Enniskillen.
Goudie, John.....	Petrolia.....	Petrolia and Enniskillen.
Gregory, H.....	Petrolia.....	Petrolia and Enniskillen.
Hamlin, F. G.....	Petrolia.....	Petrolia and Enniskillen.
Hastie, Wm.....	Sarnia.....	Petrolia and Enniskillen.
Heal, John.....	Petrolia.....	Moore.
Hillis, James T. and Sons.....	Oil Springs.....	Oil Springs.
Houston, King, Estate.....	Petrolia.....	Petrolia and Enniskillen.
Howell, H. H.....	Cainsville.....	Onondaga.
Howlett, Fred.....	Petrolia.....	Petrolia and Enniskillen.
Jewell, Dan.....	Oil Springs.....	Oil Springs.
Johns, Wm.....	Wyoming.....	Plympton.
Kelly, J. E.....	Petrolia.....	Petrolia and Enniskillen.
Kerr, John, Estate.....	Petrolia.....	Petrolia and Enniskillen.
Kerr, Mrs. Ross.....	Sarnia.....	Petrolia and Enniskillen.
Kettle, Robert.....	Petrolia.....	Petrolia and Enniskillen.
Kirk, Elmer.....	Petrolia.....	Moore.
Levine, Herbert.....	Petrolia.....	Petrolia and Enniskillen.
Levitt, C.....	Wyoming.....	Plympton.
Lewis, John J., Estate.....	Oil Springs.....	Oil Springs.
Logan, Herbert.....	Petrolia.....	Petrolia and Enniskillen.
Loxton, Thos.....	Petrolia.....	Petrolia and Enniskillen.
Maw, F. W.....	Petrolia.....	Petrolia and Enniskillen.
McDonald, F. D.....	Petrolia.....	Petrolia and Enniskillen.
McDougall, D.....	Petrolia.....	Petrolia and Enniskillen.
McCaffery, Richard.....	Bothwell.....	Bothwell.
McGillivray, Geo. A.....	201 Mt. Pleasant Ave., London.....	Oil Springs.
McIntyre, D.....	Petrolia.....	Petrolia and Enniskillen.
McKay, John.....	Sarnia.....	Sarnia.
McLean, L.....	Newbury.....	Mosa.
McLellan, Walter.....	Petrolia.....	Moore.
McMann, Alex.....	Wyoming.....	Plympton.
McNaughton, J. D.....	Newbury.....	Mosa.
McRichie, C. and A.....	Bothwell.....	Bothwell.
Metcalf, J. N.....	Petrolia.....	Petrolia and Enniskillen.
Miller, F. J.....	Sarnia.....	Sarnia.
Miller, W. W.....	Petrolia.....	Moore.
Miller, H. Roy.....	Sarnia.....	Sarnia.
Mills, A. J.....	Corunna.....	Sarnia.
Mills, J. E. and Moorehouse.....	Petrolia.....	Moore.
Mitchell, Wesley.....	Sarnia.....	Sarnia.
Morningstar, L. H.....	Oil Springs.....	Oil Springs.
Morningstar & Jackson.....	Oil Springs.....	Oil Springs.
Morris, Geo.....	Petrolia.....	Petrolia and Enniskillen.
Mott & Mitchell.....	Oil Springs.....	Oil Springs.
Mott, E.....	Oil Springs.....	Oil Springs.
Mutual Oil Producing Co.....	London.....	Petrolia and Enniskillen.
Napper, Fred.....	Petrolia.....	Petrolia and Enniskillen.
Onondaga Oil & Gas Co.....	Brantford.....	Onondaga.
Ontario Lands & Oil Co., Ltd.....	Petrolia.....	Petrolia and Enniskillen.
Osborne Oil Producers, Ltd.....	Petrolia.....	Moore.
Owen, R. H.....	Petrolia.....	Petrolia and Enniskillen.
Parks, Mrs. E. M.....	Petrolia.....	Petrolia and Enniskillen.
Petrol Oil and Gas Co.....	301 York Bldg., Toronto.....	Dover W.
Portsmouth, T.....	Petrolia.....	Petrolia and Enniskillen.
Pratt, C. A.....	Petrolia.....	Moore.
Rainsberry, N. J.....	Petrolia.....	Sarnia.
Rainsberry, Walter.....	Petrolia.....	Petrolia and Enniskillen.
Rawson, A.....	Petrolia.....	Petrolia and Enniskillen.
Richardson, Geo.....	Wyoming.....	Plympton.
Ruckle, H.....	Petrolia.....	Sarnia.

Petroleum Industry—Concluded

Name	Address	Location
<i>Field</i>		
ONTARIO—Continued—		
Schumacher, Bowen W.....	112 W. Adams St., Chicago, Ill., U.S.A.	Petrolia and Enniskillen.
Smith, S. J.....	Sarnia.....	Moore.
Smith, T. E.....	Sarnia.....	Sarnia.
Sproule, Bros.....	Oil Springs.....	Oil Springs.
Stonehouse Bros.....	Petrolia.....	Moore.
Summit Oil Co.....	610 Union Trust Bldg., Rochester N.Y., U.S.A.	
Tuer, J. T.....	Wyoming.....	Bothwell.
Vacuum Oil & Gas Co.....	35 Richmond St., Toronto.....	Plympton.
Wallen, Alex Co.....	Oil Springs.....	Thamesville.
Wallen, John, Estate.....	Oil Springs.....	Oil Springs.
Wallen & Wallen, Estate.....	Oil Springs.....	Oil Springs.
Walsh, T.....	Petrolia.....	Petrolia and Enniskillen.
Warwick, Joseph.....	Oil Springs.....	Oil Springs.
Watt, P. J.....	London.....	Petrolia and Enniskillen.
Willett, G. E.....	Bothwell.....	Bothwell.
Winnett, J. W. G.....	Bothwell.....	Bothwell.
Woodward, John.....	Oil Springs.....	Oil Springs.
Woodward, Wm.....	Oil Springs.....	Oil Springs.
Yerks, Carlton.....	Petrolia.....	Petrolia and Enniskillen.
Young, W. E.....	Wyoming.....	Plympton.
SASKATCHEWAN—		
<i>Drilling—</i>		
Ribstone-Wainwright Oils Ltd.....	Readlyn.....	Readlyn.
Simpson Oil Co., Ltd.....	Simpson.....	Simpson.
Unity Valley Oil Co., Ltd.....	207 Lancaster Bldg, Calgary.....	Unity Valley.
ALBERTA—		
<i>Producing—</i>		
British Petroleums Ltd.....	317 Bower Bldg., Vancouver, B.C.....	Wainwright.
Canada Southern Oil and Refining Co., Ltd.....	Black Diamond.....	Turner Valley.
Dalhousie Oil Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Devenish Petroleum Ltd.....	300 Leeson-Laneham Block, Calgary.....	Skiff.
Edmonton-Wainwright Oils, Ltd.....	Wainwright.....	Wainwright.
Foothills Oil and Gas Co., Ltd.....	56 Church St., Toronto, Ont.....	Turner Valley.
Illinois-Alberta Oils Ltd.....	211 Lancaster Bldg., Calgary.....	Turner Valley.
McLeod Oil Co., Ltd.....	507 Grain Exchange Bldg., Calgary.....	Turner Valley.
New McDougall-Segur Oil Co., Ltd.....	38 Union Bank Bldg., Calgary.....	Turner Valley.
Okalta Oils Ltd.....	1015 Herald Bldg., Calgary.....	Turner Valley.
Royalite Oil Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Vulcan Oils Ltd.....	Vulcan.....	Turner Valley.
<i>Drilling—(but not producing)—</i>		
Advance Oil Co., Ltd.....	521-22 P. Burns Bldg., Calgary.....	Ribstone.
Big Chief Oil Co., Ltd.....	112 Alexander Corner, Calgary.....	Turner Valley.
British Dominion Oil and Development Corp., Ltd.....	211-212 Dominion Bank Bldg., Calgary.....	Turner Valley.
British Wainwright Oil and Development Co., Ltd.....	501 Lombard Bldg., Winnipeg, Man.....	Wainwright.
Calmont Oils, Ltd.....	400 Lancaster Bldg., Calgary.....	Turner Valley.
Coats, McCoy and McCann.....	Didsbury.....	Olds.
Dolomite Oils Ltd.....	Canada Life Bldg., Calgary.....	Turner Valley.
Dutch America Oils, Ltd.....	303 Maclean Block, Calgary.....	Turner Valley.
Eagle Butte Oil Co., Ltd.....	Medicine Hat.....	Cypress Hills.
Emerald Oils, Ltd.....	10119-100A St., Edmonton.....	Wainwright.
Fuego Oil Co., Ltd.....	Oyen.....	Fuego.
Gold Coin Oils, Ltd.....	403 Grain Exchange Bldg., Calgary.....	Morley.
Great West Oils, Ltd.....	3 Alberta Block, Calgary.....	Turner Valley.
Highland Oil Co., Ltd.....	914 Lancaster Bldg., Calgary.....	Turner Valley.
Home Oil Co., Ltd.....	Canada Life Bldg., Calgary.....	Turner Valley.
Interior Oil Co., Ltd.....	Wainwright.....	Wainwright.
London-Ribstone Petroleums, Ltd.....	626 Pender St. W., Vancouver, B.C.....	Ribstone.
Marquis of Anglesey.....	501 Herald Bldg., Calgary.....	De Winton.
New Valley Oil Co., Ltd.....	216 Alberta Corner, Calgary.....	Turner Valley.
Northwest Company, Ltd.....	56 Church St., Toronto, Ont.....	Highwood.
Ranchmen's Gas and Oil Co., Ltd.....	509 Grain Exchange Bldg., Calgary.....	High River..
Ribstone Oils, Ltd.....	55 Canada Life Bldg., Calgary.....	Ribstone.
Seneca Oils, Ltd.....	38 Canada Life Bldg., Calgary.....	Turner Valley.
Signal Hill Oil Co., Ltd.....	313 Lancaster Bldg., Calgary.....	Moose Mountain.
Spooner Oils, Ltd.....	311 Lancaster Bldg., Calgary.....	Turner Valley.
Stockmen's Oils, Ltd.....	315 McLean Block, Calgary.....	Turner Valley.
Wabash Oils, Ltd.....	Cor. 10th and 11th Sts., W. Calgary.....	Morley.

OTHER NON-METAL MINING INDUSTRIES

Actinolite Mining Industry

		<i>Township</i>
ONTARIO—		
Actinolite Mining Co., Ltd.....	Bloomfield, N.J.....	Kaladar.

Asbestos Mining Industry

Name	Address	Location
QUEBEC—		
Asbestos Corporation, Ltd.	Canada Cement Company Bldg., Montreal.	Mine Township King—Thetford. Beaver—Coleraine. Boston—Broughton. British Canadian—Coleraine. Consolidated—Thetford. Maple Leaf—Coleraine. Vimy Ridge—Ireland. Bell—Thetford. Greenshield—Coleraine. Jeffrey—Shipton. Johnson's—Thetford. Johnson's—Coleraine.
Bell Asbestos Mines, Inc. (Keasbey and Mattison)	Ambler, Pa., U.S.A.	
Canada Asbestos and Chrome Co.	Black Lake.	
Canadian Johns-Manville Co., Ltd.	450 St. James St., Montreal.	
Johnson's Company.	Thetford Mines.	
Northern Asbestos Co., Ltd.	Thetford Mines.	—Thetford.
Quebec Asbestos Corp., Ltd.	East Broughton.	Quebec—Broughton.

Barytes

NOVA SCOTIA—		
Brandram-Henderson, Ltd.	Montreal, P.Q.	East Lake Ainslie, Inverness County.

Bituminous Sands

ALBERTA—		
Federal Department of Mines.	Sussex St., Ottawa, Ont.	Fort McMurray district.
McMurray Asphaltum and Oil Co., Ltd.	Petrolia, Ont.	Fort McMurray district.

Diatomite

NOVA SCOTIA—		
Oxford Tripoli Sales Co., Inc.	People's Bank Bldg., Haverstraw, N.Y.	East New Annan.

Feldspar Mining Industry

MINES—		Township
QUEBEC—		
Bigelow, A. and G.	Manchester, Conn., U.S.A.	Aylwin.
Bon Ami, Ltd.	Box 11, Buckingham.	Buckingham.
Cameron, Wm. and J. J.	Glen Almond.	Glen Almond.
Couture, S. E.	Glen Almond.	Buckingham.
Donaldson, R. J.	Buckingham.	Buckingham.
Laneville, John.	N. D. de la Salette.	Portland W.
Lapointe, E.	86 Notre Dame St. W., Montreal.	Portland W.
Laurentian Feldspar Co., Ltd.	1105 Beaver Hall Hill, Montreal.	Thelmina.
Melkman, S. E. and Newbauer, J. M.	Glen Almond.	Derry.
Mercier, Henri.	Ottawa Electric Bldg., Sparks St., Ottawa, Ont.	Derry.
O'Brien & Fowler.	Glen Almond.	Derry.
Parcher, A.	Buckingham.	Buckingham.
Pedneaud, G.	475 Kent St., Ottawa, Ont.	Derry.
Whittemore, Mrs. A. R.	Poupore.	Buckingham.
Winning and Elliott.		
ONTARIO—		
Bathurst Feldspar Mines, Ltd.	230-232 King St. E., Toronto.	Bathurst.
Consolidated Feldspar Mines.	29 Melinda St., Toronto.	Ratter.
Craig, T. H.	Verona.	Loughborough.
Feldspar Mines Corp., Ltd.	1507 Bank of Hamilton Bldg., Toronto.	Bedford, Portland and Lough- borough.
Genesee Feldspar Co.	82 Augustine St., Rochester, N.Y., U.S.A.	Monteagle.
Rock Products Co.	Lock Box 332, Toledo, Ohio, U.S.A.	Bathurst.
Verona Quarries.	21 Main St. E., Hamilton, Ont.	Loughborough.
Wanup Feldspar Mines, Ltd.	Lucknow.	Dill.
MILLS—		
ONTARIO—		
Frontenac Floor and Wall Tile Co., Ltd.	Kingston.	Plant at Kingston.

Garnets

Name	Address	Location
QUEBEC— Labelle Nickel and Garnet Co., Ltd.....	Labelle.....	Joly township.

Graphite Mining Industry

QUEBEC— Canadian Graphite Corporation.....	1193 Phillips Place, Montreal.....	Boyer. <i>Township</i>
ONTARIO— Black Donald Graphite Co., Ltd.....	Calabogie.....	Brougham.

Grindstone Industry

NOVA SCOTIA— Murphy Logan..... Sutherland, Jas. W.....	Waugh's River..... Egerton.....	Colchester B. Quarry Id.
NEW BRUNSWICK— Miramichi Quarry Co., Ltd..... Read Stone Co., Ltd.....	Quarryville..... Sackville.....	Quarryville. Stonehaven.
BRITISH COLUMBIA— MacDonald, J. A. and C. H.....	Vancouver.....	Newcastle Island.

Gypsum Mining Industry

NOVA SCOTIA— Atlantic Gypsum Products Co.....	40 Central St., Boston, Mass., U.S.A.	Walton, Hants Co. and Cheti- camp, Inverness Co.
Canadian Gypsum Co., Ltd.....	Windsor.....	Wentworth, Hants Co.
Cape Breton Gypsum Co., Ltd.....	Iona.....	Iona, Victoria Co.
Connecticut-Adamant Plaster Co., Ltd.....	New Haven, Conn., U.S.A.....	Cheverie, Hants Co.
Higginson Manufacturing Co.....	Newburg, N.Y., U.S.A.....	Newport Station, Hants Co.
Ingonish Gypsum Co., Ltd.....	Canada Cement Bldg., Montreal, P.Q.....	Ingonish Beach, Victoria Co. Iona.
Iona Gypsum Products Ltd.....	Box 60, Sydney.....	Ottawa Brook, Victoria Co.
Newark Plaster Co.....	Ottawa Brook.....	Baddeck Bay, Victoria Co.
North American Gypsum Co.....	Baddeck.....	Mabou, Inverness Co.
Nova Scotia Coal and Gypsum Co., Ltd.....	Mabou.....	Windsor, Hants Co.
Windsor Plaster Co., Ltd.....	Windsor.....	
NEW BRUNSWICK— Albert Manufacturing Co..... Stewart, J. E.....	Hillsborough..... Plaster Rock.....	Hillsborough, Albert Co. Plaster Rock.
ONTARIO— Canada Gypsum and Alabastine, Ltd.....	Paris.....	Caledonia, Seneca Tp.; Lythmore, Oneida Tp.
MANITOBA— Manitoba Gypsum Co., Ltd.....	Box 3057, Winnipeg.....	Gypsumville.
BRITISH COLUMBIA— Basque Ranch, Ltd..... British Columbia Gypsum Co., Ltd..... Canada Cement Co., Ltd..... Henderson, Robert.....	Ashcroft..... Box 59, New Westminster..... Montreal, P.Q..... Canford.....	Basque Ranch. Falkland. Mayook. Canford.

Iron Oxide Mining Industry

QUEBEC— Argall, Thos. H..... Canada Paint Co., Ltd..... Montmorency Paint Products Co., Ltd.....	La Pointe du Lac..... 572 William St., Montreal..... 83 Craig St. W., Montreal.....	Pointe du Lac, St. Maurice Co. Red Mill, Champlain Co. Montmorency Co.
BRITISH COLUMBIA— Davidson, J. G..... McDonald, R. W.....	1641 Woodland Drive, Vancouver.... Box 157, Banff, Alta.....	Near Alta Lake. Windermere District.

Magnesite Mining Industry

Name	Address	Location
QUEBEC—		<i>Township</i>
International Magnesite Co., Ltd.....	Calumet.....	Hartington.
North American Magnesite Producers, Ltd.....	Magnesite.....	Grenville.
Scottish Canadian Magnesite Co.....		Grenville.

Mica Mining Industry

QUEBEC—		<i>Township</i>
Blackburn Bros., Ltd.....	Blackburn Building, Ottawa, Ont...	Templeton.
Brown Bros.....	Cantley.....	
Chenier, Z. E.....	Rockland, Ont.....	Grenville.
Cross, W. C.....	Cascades.....	
Flynn, H. J.....	33 Montcalm St., Hull.....	
Gauthier, J. B.....	Buckingham.....	Buckingham.
Laurentide Mica Co., Ltd.....	East Pittsburg, Pa., U.S.A.....	Templeton.
McGlashan, R. J. & Co.....	90 Montcalm St., Hull.....	Hull.
Martin, A. G.....	236 Besserer St., Ottawa, Ont.....	Hull.
Mineral Products Co., Ltd.....	330 Bay St., Toronto 2, Ont.....	Plant at Hull.
Perkins Mining Co.....	Gatineau Pointe.....	Templeton.
Wallingford, Geo. & Chas.....	495 Clarence St., Ottawa, Ont.....	Hull.
Wallingford Bros., Ltd.....	Perkins.....	Templeton.
ONTARIO—		
Bennett, H. V.....	Perth.....	South Elmsley.
Kent Bros. and Estate J. M. Stoness.....	Kingston.....	Bedford.
Lee, W. W.....	Bedford Mills.....	
Loughborough Mining Co., Ltd.....	Sydenham.....	Loughborough.
McLaren, W. L.....	Perth.....	North Burgess.
McNaughton, G. D.....	Sydenham.....	
Martin, A. G.....	236 Besserer St., Ottawa.....	South Burgess.
Orser McKenzie Mica Milling Co.....	Bancroft.....	Monmouth.

Mineral Waters Industry

QUEBEC—		
Abenakis Springs Co.....	Abenakis Springs.....	Abenakis Springs.
L'Eau Naturelle Purgative de Chambord Ltée.....	Desbiens.....	Metabetchouan.
Roy, Cyprien.....	St. Germain.....	L'Islet Plate.
ONTARIO—		
Belanger, A.....	Papineauville, P.Q.....	N. Plantagenet.
Caledonia Springs Co., Ltd.....	6380 St. Urbain St., Montreal, P.Q.....	Caledonia Springs.
Carlsbad Ltd.....	Carlsbad Springs.....	Bourget.
Deneault, F.....	Bourget.....	Gloucester Tp.
Goderich Mineral Water Co.....	Goderich.....	Bourget.
Gurd, Charles & Co., Ltd.....	1016 Bleury St., Montreal, P.Q.....	Goderich.
Sanitaris, Ltd.....	Box 353, Arnprior.....	Caledonia.
		Pakenham Tp.

Phosphate Mining Industry

QUEBEC—		
Carisse, Pierre.....	Perkins Mills.....	
ONTARIO—		
McLean, W. L.....	Box 20, Perth.....	N. Burgess Tp.
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Co., Ltd.....	Trail.....	Crows Nest, Fort Steele Mining Division.

Pyrites Mining Industry

QUEBEC—		
Eustis Mining Co.....	Eustis.....	Ascot Tp.
Consolidated Copper and Sulphur Co.....		
ONTARIO—		
Grasselli Chemical Co., Ltd.....	Hamilton.....	Blythefield Tp.
BRITISH COLUMBIA—		
Britannia Mining and Smelting Co., Ltd.....	Britannia Beach.....	Britannia Mine, Vancouver Mining Division.

Quartz Mining Industry

Name	Address	Location
NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.	Sydney	Leitches Creek.
River Dennis Sand and Clay Co., Ltd.	Fort Hood	Melford, Inverness Co.
QUEBEC—		
Cameron, Wm. & J. J.	Buckingham	Buckingham Tp.
Canada Glass Products, Ltd.	193 Main St., Hull	East Templeton.
Donaldson, Robert J.	Glen Almond	Buckingham Tp.
Montpetit, Euclide	Melocheville	Melocheville, Beauharnois Co.
O'Brien & Fowler	c/o M. J. O'Brien Ltd., Ottawa, Ont.	Derry Tp.
Pedneaud, G.	Buckingham	Buckingham Tp.
Silico Ltd.	37 rue Mayor, Montreal	Parish of St. Canut.
ONTARIO—		
Anderson, J. G.	Wanup	
Booth, E. C. Conger Refractory Materials Co.	Gordon Bay	Gordon Bay, Conger Tp.
Dominion Mines and Quarries, Ltd.	Canada Life Bldg., 46 King St. W., Toronto	District of Algoma (East Neebish Quarry and Killarney Quarry).
Manitoulin Quartzite Ltd.	214 John St., Toronto	Manitoulin Island.
Mond Nickel Co., Ltd.	Coniston	Neelon Tp.
Orser, S. H.	Perth Road	Verona.
Raynor, G. W.	151 Roxborough St. E., Toronto	Hybla.
Wright & Co.	960 Queen St., Sault Ste. Marie	Deroche Tp.
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Company of Canada, Ltd.	Trail	Oliver.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Anyox	Observatory Inlet, Portland Canal.

Salt Industry

NOVA SCOTIA—		
Malagash Salt Co., Ltd.	New Glasgow	Malagash, Cumberland Co.
ONTARIO—		
Brunner-Mond, Canada, Ltd.	Amherstburg	Amherstburg, Essex Co.
Canadian Salt Co., Ltd.	Sandwich	Windsor and Sandwich, Essex Co.
Dominion Salt Co., Ltd.	Drawer M, Sarnia	Sarnia, Lambton Co.
Exeter Salt Works Co., Ltd.	Exeter	Exeter, Huron Co.
Goderich Salt Co., Ltd.	Goderich	Goderich, Huron Co.
Kincardine Salt Co., Ltd.	Kincardine	Kincardine.
Western Canada Flour Mills Co., Ltd.	287 Macpherson Ave., Toronto	Goderich, Huron Co.
Western Salt Co., Ltd.	411 Dominion Bank Bldg., Toronto	Courtright, Lambton Co.
ALBERTA—		
Alberta Salt Co., Ltd.	McLeod Building, Edmonton	Fort McMurray.

Silica Brick Industry

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.	Sydney	Sydney.
ONTARIO—		
Algoma Steel Corporation, Ltd.	Sault Ste. Marie	Sault Ste. Marie.

Sodium Carbonate Mining Industry

BRITISH COLUMBIA—		
Lloyd-Campbell, Ltd.	422 Standard Bank Bldg., Vancouver	Coulson Spur.
Soda Mining and Products Co., Ltd.	423 Hamilton St., Vancouver	Clinton Div.

Sodium Sulphate Mining Industry

Name	Address	Location
SASKATCHEWAN— Bishopric and Lent Co.....	Spring Grove and Esto Ave., Cincinnati, Ohio, U.S.A.....	Frederick Lake.

Talc and Soapstone Industry

QUEBEC— Houle, J..... Robertsonville Soapstone Quarry Co.....	St. Antoine de Pontbriand..... Robertsonville.....	Thetford Tp. Broughton Tp.
ONTARIO— Asbestos Pulp Co., Ltd..... Gillespie Co., Ltd., Geo. H. (Mill)..... Grace Mining Co..... Henderson Mines, Ltd.....	Madoc..... Madoc..... 15 Genesee St., Buffalo, N.Y..... Madoc.....	Huntingdon Tp. Plant at Madoc. Vermilion Bay. Huntingdon Tp.
BRITISH COLUMBIA— Eagle Talc and Mining Co., Ltd..... National Talc, Ltd.....	Pemberton Building, Victoria..... 312 McKinnon Building, Melinda St., Toronto, Ont.....	Vancouver Island. Red Mt. Mineral Claim.

Volcanic Dust Industry

SASKATCHEWAN— Old Sol Manufacturing Co., Ltd..... Van Kel Cleansers, Ltd.....	805 Erin St., Winnipeg, Man..... Swift Current.....	Waldeck. Waldeck and Beverly.
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CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

CLAY PRODUCTS INDUSTRY

Brick and Tile

Name	Address	Location
NOVA SCOTIA— Brooks, Geo..... Brooks, Stephen, and Sons..... Miller, Jas. B..... Nova Scotia Clay Works, Ltd..... Shaw, L. E., Ltd.....	New Glasgow..... Box 359, New Glasgow..... Elmsdale..... Havelock St., Amherst..... Avonport.....	Plymouth. New Glasgow. Barney's Brook. Elmsdale. Pugwash. Avonport.
NEW BRUNSWICK— Ryan, M., and Sons, Ltd.....	Woodstock Road, Fredericton.....	Woodstock Road, Fredericton.
QUEBEC— Ascot Tile and Brick Co., Ltd..... Bell, W. and D..... Citadel Brick, Ltd..... Gravel, Joseph..... Hodgins, David T..... La Brique de Chicoutimi Ltée..... La Cie de Brique de L'Islet Ltée..... Lennoxville Brick and Tile Co..... L'Industrielle de St. Tite, Ltd..... Longpré, Emile..... National Brick Co. of Laprairie, Ltd..... Oliver, Frank..... Froulx Frères..... St. Lawrence Brick Co., Ltd., The..... Scott Brick Co., Ltd.....	Ascot Corner..... 1286 St. Valier St., Quebec..... 14 St. Joseph St., Quebec..... Acton Vale..... Shawville..... Chicoutimi..... 64 rue de la Gare, Montmagny..... Lennoxville..... St. Tite..... St. Félix de Valois..... Canada Cement Co. Bldg., Montreal..... Ormstown..... P.O. Box 384, Richmond..... 71 St. James St., Montreal..... 8 rue St. Joseph, Quebec.....	Ascot Corner. Little River Rd. Boischatel. L'Islet Station. Acton Vale. Shawville. Chicoutimi. Montmagny. Ascot Range. St. Tite. St. Félix de Valois. Delson. Laprairie. Ormstown. Richmond. Laprairie. Scott Junction.

Brick and Tile—Continued

Name	Address	Location
ONTARIO—		
Alvinston Brick and Tile Co., Ltd.	Box 26, Alvinston	Alvinston.
Baker, Geo. E.	Arnprior	Arnprior.
Chapman Brick Co., Ltd.	1044 Dawes Road, Toronto	East York.
Bartonville Pressed Brick Co., Ltd.	620 Lister Block, Hamilton	Bartonville.
Batchelor, Samuel	Proton Station	Proton Station.
Booth Brick and Lumber Co., The	Drawer 61, New Toronto	Etobicoke Tp.
Brampton Pressed Brick Co., Ltd.	Brampton	Brampton.
Broadwell, B. & Son	Kingsville	(Near) Kingsville.
Butwell, R.	107 Lakeshire Rd., Toronto	Etobicoke.
Caledon Mountain Shale Products	600 Bay St., Toronto	Caledon.
Campbell, Neil F. & Sons	R.R. No. 1, West Lorne	West Lorne.
Canadian Fireclay Products, Ltd.	601 Adelaide St. E., Toronto	New Toronto.
Canadian Pressed Brick Co., Ltd.	195 Ottawa St., S., Hamilton	Hamilton.
Cheeseman, Peter	670 King St. W., Hamilton	Hamilton.
Cooksville Shale Brick Co., Ltd.	26 Queen St. E., Toronto	Cooksville.
Cooper, W. H.	312 Clyde Block, Hamilton	Hamilton.
Cornhill, James & Sons, Ltd.	Grand Ave. E., Chatham	Chatham.
Crang, Jethro	22 Thorne Crescent, Toronto 10	Toronto.
Crawford Bros.	451 King St. W., Hamilton	Hamilton.
Curtin, Frank	R.R. No. 4, Lindsay	Lindsay.
Curtis Bros.	Box 809, Peterboro.	Peterboro.
De Laplante, J. E.	Dawes Rd., Coleman P.O., Toronto	Toronto.
Deller, Albert, and Son.	Brownsville	Brownsville.
Deller Bros.	R.R. No. 2, Norwich	(Near) Norwich.
Deverell, T. G.	Whitby	Whitby.
Dolan, John	R.R. No. 2, Watford	Warwick.
Dominion Sewer Pipe and Clay Industries, Ltd.	Swansea	Aldershot.
Donaldson, S. E.	R.R. 4, Harriston	Fulton Mills.
Donaldson, G.	Greenock	Greenock.
Don Valley Brick Works, Ltd.	114 Federal Bldg., Toronto	Todmorden.
Douglas and Douglas	Wilkesport	Wilkesport.
Dublin Brick and Tile Yard	Dublin	Dublin S.
Dunn, D.	Box 74, New Liskeard	New Liskeard.
Elliott, Charles	Bluevale	Bluevale.
Elliott, Wm.	Glenannan	Glenannan.
Elliott, James, Jr.	519 Wellington St. W., Sault Ste. Marie	E. Korah Tp.
Fort William Brick Co.	500 Victoria Ave., Fort William	West Fort William.
Frid Bros.	Macklin St. and Dundas Road, Hamilton	Hamilton.
Gammage, C. R.	R.R. No. 2, Dresden	Dresden.
Gardiner, Wm.	Box 83, Blenheim	Blenheim.
Godfrey, Thomas & Co.	Carleton Place	Carleton Place.
Grimsby Brick and Tile Co.	Grimsby	Grimsby.
Hallatt, Herbert & Son	Box 93, Comber	Comber.
Hallatt, Wm.	Richards Bldg., Chatham	Merlin.
Halton Brick Co., Ltd.	28 Symes Rd., Toronto 9	Equesting Tp.
Hamilton Pressed Brick Co.	Kensington Ave. S., Hamilton	Hamilton.
Hill, A. W.	R.R. 1, Coatsworth	East Tilbury Tp.
Hill, Aaron	Essex	Essex.
Hircock Bros.	Box 83, Bowmanville	Bowmanville.
Hitch, D. A.	Erie St. N., Ridgetown	Ridgetown.
Hitch, Thos.	Box 254, St. Thomas	St. Thomas.
Hodder, Mrs. J. H. and Sons	Dutton	Dutton.
Houston Co., Ltd.	Tweed	Tweed.
Howlett, Fred and Sons	Box 3, Petrolia	Petrolia.
Huntsville Brick and Tile Works	Huntsville	Huntsville.
Interprovincial Brick Co., Ltd.	30 Toronto St., Toronto	(Cheltenham, Milton).
Jackson, W. B.	290 Rawdon St., Brantford	Brantford.
Janes, D. A.	R.R. No. 1, Mt. Brydges	Mt. Brydges.
Jamieson Lime Co.	Renfrew	Renfrew.
Jasperson, B. Brick and Tile Yards	Kingsville	Coatsworth.
Jervis, W. J.	R.R. No. 3, Dorchester Station	Dorchester Station.
Koebel, Bros.	Box 54, Clements	St. Clements.
Kruse Bros.	Seaford	Tuckersmith Tp.
Labey, Geo. A. and Son	Foxboro	Foxboro.
Lindsay, Earl	R.R. No. 2, Wallaceburg	Wallaceburg.
Martin, Thos. E.	Thamesville	Thamesville.
McComb, Chester	Denfield	Elginfield.
McCormick Bros.	R.R. No. 5, Watford	Kingscourt Junction.
McEachran, N.	Highgate	Highgate.
Melvor Bros.	Buchanan St., Cobourg	Cobourg.
McMahon, Robert	R.R. No. 2, Kerwood	Strathroy.
Middleton, C.	Wyoming	Wyoming.
Milton Brick, Ltd.	Milton	(Milton, Streetsville).
Miner, Manly F.	Kingsville	Kingsville.
Missouri Tile Yard (W. H. Deller)	R.R. No. 4, Thorndale	Thorndale.
Morley Walker Brick Co.	114 Greenwood Ave., Toronto	Dawes Road, East Toronto.
Napanee Brick and Tile Works (J. Chapman)	R.R. No. 3, Napanee	Napanee.
Ollman Bros.	111 Macklin St., Hamilton	Hamilton.
Ontario Denison Tile Co., Ltd.	24 Wyandotte St. E., Windsor	(Tilbury, Fletcher).
Ottawa Brick and Terra Cotta Co., Ltd.	Billings Bridge	Billings Bridge.

Brick and Tile—Concluded

Name	Address	Location
ONTARIO—Concluded		
O'Reilly, T. E.	320 Bay St., Ottawa.	Hog's Back.
Ott Brick and Tile Mfg. Co., Ltd., The.	33 King St. E., Kitchener.	Kitchener.
Owen Sound Brick Co., Ltd., The.	928 2nd Ave. E., Owen Sound.	Owen Sound.
Parks, Henry W.	R.R. No. 2, Dresden.	Dresden.
Paxton, Fred R.	230 Queenston St., St. Catharines.	St. Catharines.
Pembroke Brick Co., The.	Pembroke.	Pembroke.
Phillips, Thomas & Son.	R.R. No. 2, Lucknow.	St. Helens.
Phinn Bros.	238 Briscoe St., London.	London.
Phippen & Field.	150 Daves Rd., Toronto.	Toronto.
Piggott, Geo. & Co.	72 Guestville Ave., Toronto 2.	Mount Dennis.
Port Rowan Brick and Tile Co.	Port Rowan.	Port Rowan.
Price and Cumming.	Salisbury Ave., Humber Bay.	Humber Bay.
Price and Smith.	458 Greenwood Ave., Toronto.	Toronto.
Provincial Brick Plant.	Parliament Bldg., Toronto.	Mimico.
Red Star Brick and Tile Yard (W. H. Barnhardt)	Stratford.	Stratford.
Richardson, Jas. & Son.	Kerrwood.	Kerrwood.
Riselay Brick Co., Ltd.	Main St. W., Hamilton.	Hamilton.
Russell Brick Co.	40 Blake St., Toronto.	Toronto.
Smith, Alex. & Son.	R.R. No. 2, Dutton.	Dutton.
Snelgrove, A.	Beaverton.	Thorah Tp.
Sproat, Wm. M.	R.R. No. 4, Seaforth.	Tuckersmith Tp.
Standard Brick Co., Ltd., The.	500 Greenwood Ave., Toronto.	Toronto.
Steele, Edwin.	Vankleek Hill.	Vankleek Hill.
Stratford Brick, Tile and Lumber Co.	Mansion House, Stratford.	Stratford.
Streetsville Brick Co., Ltd., The.	410 Crown Office Bldg., Toronto 2.	Streetsville.
Stroh, M. C.	Conestogo.	Conestogo.
Sun Brick Co., Ltd.	1104 Bay St., Toronto.	Todmorden.
Superior Brick and Tile Co., Ltd.	426 Victoria Ave., Fort William.	Paipoonse Tp.
Sutherland, W. A.	Box 293, Parkhill.	Parkhill.
Tope, Richard, Estate.	948 King St. W., Hamilton.	Hamilton.
Toronto Brick Co., Ltd.	897 Bay St., Toronto.	(Milton) Toronto.
Wagstaff, Charles.	R.R. No. 4, Lindsay.	Lindsay.
Wagstaff, A. H. & Co.	348 Greenwood Ave., Toronto.	Toronto.
Wallace, R. & Son.	66 First Ave. E., North Bay.	North Bay.
Wein, Aaron.	Crediton.	Crediton.
Windsor Brick and Tile Co.	203 Exchange Bldg., Windsor.	Near Kingsville.
Woodslee Brick and Tile Yards.	Woodslee.	Woodslee.
Wright, Geo. & Sons.	Comber.	Comber.
MANTOBA—		
Alsip Brick Tile and Lumber Co., Ltd.	200 Tribune Bldg., Winnipeg.	Winnipeg.
Marion, Joseph A.	Box 30, St. Boniface.	St. Boniface.
Snyder Brick and Clay Works, Ltd.	Sidney.	Sidney.
Snyder, A. & Co., Ltd.	Box 1401, Portage la Prairie.	Portage la Prairie.
SASKATCHEWAN—		
Bruno Clay Works, Ltd.	Bruno.	Near Bruno.
Dominion Fire Brick and Clay Products, Ltd., The	507 Scott Block, Moose Jaw.	Claybank.
Elliott, W. H. & Son.	1306 3rd Ave. N., Saskatoon.	Saskatoon.
Excelsior Brick Co., Ltd., The.	Prince Aibert.	Prince Albert.
International Clay Products, Ltd.	Estevan.	Estevan.
Shand Coal and Brick Co.	Shand.	Shand.
ALBERTA—		
Acme Brick Co., Ltd., The.	125 Alberta Block, Edmonton.	Cannell.
Benson, Ole.	Grande Prairie.	Grande Prairie.
Crandell, E. H., Pressed Brick and Sandstone Co.	607 Maclean Block, Calgary.	Brickburn.
Gas City Brick Co., Ltd.	Box 818, Medicine Hat.	Medicine Hat.
Little, J. B. & Sons.	9102-100th Ave., Edmonton.	Riverdale.
Redcliff Brick and Coal Co., Ltd.	Box B 5, Redcliff.	Redcliff.
Redcliff Pressed Brick Co., Ltd.	Box 87, Redcliff.	Redcliff.
Redcliff Premier Brick Co., Ltd.	Box C 2, Redcliff.	Redcliff.
BRITISH COLUMBIA—		
Armstrong Brick Works (C. & A. Oakland).	Armstrong.	Armstrong.
Baker Brick and Tile Co., Ltd.	Cor. Douglas St. and Tolmie Ave., Victoria.	Victoria.
Christian Community of Universal Brotherhood, Ltd., The.	Grand Forks.	Grand Forks.
Clayburn Co., Ltd.	302 Credit Foncier Bldg., Vancouver.	(Clayburn. Kilgard.)
Gabriola Shale Products, Ltd.	106 Moody Block, Victoria.	Gabriola Is.
Haug, Wm. & Son.	Kelowna.	Kelowna.
Port Haney Brick Co., Ltd., The.	346 Howe St., Vancouver.	Port Haney.
Vancouver Brick and Tile Co., Ltd.	2065-10th Ave. West, Vancouver.	Vancouver.
Victoria Brick Co., Ltd.	3001 Douglas St., Victoria.	Victoria.

Clay Sewer Pipe

Name	Address	Location
NOVA SCOTIA— Standard Clay Products, Ltd.....	New Glasgow.....	New Glasgow.
QUEBEC— Standard Clay Products, Ltd.....	St. John's.....	St. John's.
ONTARIO— Dominion Sewer Pipe and Clay Industries, Ltd.. Hamilton and Toronto Sewer Pipe Co., Ltd., The Ontario Sewer Pipe and Clay Products, Ltd.....	Swansea..... Wentworth St. N., Hamilton..... Mimico.....	Swansea. Hamilton. Mimico.
ALBERTA— Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
BRITISH COLUMBIA— Clayburn Co., Ltd.....	302 Credit Foncier Bldg., Vancouver	Kilgard.

Fire Brick, Fire Clay and Fire Clay Products

NOVA SCOTIA— Dominion Iron and Steel Co., Ltd..... Intercolonial Sales Co., Ltd.....	Sydney..... Westville.....	(Shubenacadie, Sydney. Westville.
NEW BRUNSWICK— Foley Pottery, Ltd.....	Saint John.....	Saint John.
QUEBEC— *Canada Firebrick Co., Ltd..... Montreal Terra Cotta Co., Ltd..... *Standard Clay Products, Ltd.....	371 Aqueduct S., Montreal..... 511 St. Catharines St. W., Montreal. P.O. Box 819, St. John's.....	Montreal. Lakeside. St. John's.
ONTARIO— *Bailey, Geo. & Co..... National Fire Proofing Co. of Canada, Ltd.....	331 Bay St., Toronto..... 601 Dominion Bank Bldg., Toronto.	Toronto. Aldershot.
SASKATCHEWAN— Dominion Fire Brick and Clay Products, Ltd....	421 Hammond Bldg., Moose Jaw....	Claybank.
ALBERTA— Alberta Clay Products, Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
BRITISH COLUMBIA— B. C. Refractories, Ltd..... Clayburn Co., Ltd.....	365 Water St., Vancouver..... 302 Credit Foncier Bldg., Vancouver.	Vancouver. Clayburn.

Kaolin

QUEBEC— Bryce, R. A.....	Bay St., Toronto, Ont.....	St. Remi d'Amherst.
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Stoneware and Pottery

NEW BRUNSWICK— Foley Pottery, Ltd..... Mowat, G. Helen.....	Saint John..... St. Andrews.....	Saint John. St. Andrews.
QUEBEC— *Canadian Potteries, Ltd..... *Canada Stoneware Works..... *Dominion Sanitary Pottery Co., Ltd.....	2 Longueil St., St. John's..... Iberville..... 189 St. James St., St. John's.....	St. John's. Iberville. St. John's.
ONTARIO— *Campbell's, R. Sons..... *Canadian General Electric Co..... *Canadian Porcelain Co., Ltd..... Davis, John, and Sons..... *Dominion Insulator and Manufacturing Co., Ltd. Foster Pottery Co..... *Frontenac Floor and Wall Tile Co., Ltd..... *Smith Potteries..... *Smith & Stone.....	100 Locke St. S., Hamilton..... 212 King St. W., Toronto..... Paradise Road, Hamilton..... 60 Heath St. W., Toronto..... Niagara Falls..... Main St. W., Hamilton..... Box 178, Kingston..... King St. W. and Alexander Blvd., Oshawa..... Georgetown.....	Hamilton. Peterborough. Hamilton. Toronto. Niagara Falls. Hamilton. Kingston. Oshawa. Georgetown.
ALBERTA— Medalta Potteries, Ltd.....	Medicine Hat.....	Medicine Hat.

* Produce clay products from imported clays.

Other Structural Materials.

Cement Industry

Name	Address	Location
QUEBEC—		
Canada Cement Co., Ltd.....	Box 290, Station B, Montreal.....	Hull. Montreal East.
National Cement Co.....	90 St. James St., Montreal.....	Montreal East.
ONTARIO—		
Canada Cement Co., Ltd.....	Canada Cement Co. Bldg., Montreal, P.Q.	Belleville. Lakefield.
St. Mary's Cement Co., Ltd.....	357 Bay St., Toronto.....	Port Colborne. St. Mary's.
MANITOBA—		
Canada Cement Co., Ltd.....	Canada Cement Co. Bldg., Montreal, P.Q.	Fort Whyte.
Commercial Cement Co., Ltd.....	1002 McArthur Bldg., Winnipeg.....	Babcock.
ALBERTA—		
Canada Cement Co., Ltd.....	Canada Cement Co. Bldg., Montreal, P.Q.	Exshaw.
Marlboro Cement Co.....	12128-105th Ave., Edmonton.....	Marlboro.
BRITISH COLUMBIA—		
British Columbia Cement Co., Ltd.....	305 Belmont House, Victoria.....	Bamberton.

Lime Industry

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.....	Sydney.....	Sydney.
Eastern Lime Co. (H. C. Burchell).....	Windsor.....	Windsor.
NEW BRUNSWICK—		
Bathurst Co., Ltd.....	Bathurst.....	Bathurst.
Peters, C. H. & Sons, Ltd.....	Ward St., St. John.....	Torriburn.
Provincial Lime Co., Ltd.....	89 Water St., St. John.....	Lawlor's Lake.
Purdy and Green.....	323 Main St., St. John.....	St. John.
Stetson, Cutler & Co., Ltd.....	Campbellton.....	St. John.
QUEBEC—		
Arnaud & Beaudry.....	Joliette.....	Joliette.
Baron, A. et Frere.....	St. Dominique de Bagot.....	St. Dominique de Bagot.
Boivin, Arthur.....	Pont Rouge.....	Pont Rouge.
Canada Lime Co.....	St. Marc des Carrieres.....	St. Marc des Carrieres.
Dominion Lime Co., The.....	East Angus.....	Lime Ridge.
Ducharme, C.....	Guigues.....	Guigues.
Heon, Octave.....	St. Louis de Champlain.....	St. Louis de Champlain.
Lalumiere, Joseph.....	St. Dominique de Bagot.....	St. Dominique de Bagot.
Laurentian Stone Co., Ltd.....	250 Catherine St., Ottawa, Ont.....	Hull.
Limoges, Fils et Cie.....	552 rue Poupart, Montreal.....	Montreal.
Naud, Francis.....	St. Marc des Carrieres.....	St. Marc des Carrieres.
St. Vincent de Paul, Penitentiary.....	St. Vincent de Paul.....	St. Vincent de Paul.
Standard Lime Co.....	Joliette.....	St. Marc des Carrieres. St. Paul de Joliette.
Stinson-Reeb Builders' Supply Co., Ltd.....	230 Dorchester St. W., Montreal.....	Montreal.
ONTARIO—		
Canada Gypsum Alabastine Co., successors to Alabastine Co., Paris, Ltd., The.....	Paris.....	Elora. Teeswater.
American Cyanamid Co.....	535-5th Ave., New York City, N.Y.	Niagara Falls.
Beachville White Lime Co., Ltd.....	Beachville.....	Beachville.
Biederman, Albert G.....	Golden Lake.....	Golden Lake.
Brunner-Mond (Canada), Ltd.....	Amherstburg.....	Anderdon Township.
Cameron, W. M.....	Carleton Place.....	Carleton Place.
Canada Lime Co., Ltd.....	465 Bay St., Toronto.....	Cobocook.
Chalmers Lime Works.....	689 Seventh St. W., Owen Sound.....	Owen Sound. Hespeler.
Christie, Henderson & Co., Ltd.....	201 Crown Office Bldg., Toronto 2.....	Kelso. Puslinch.
Dominion Rock Products Co., Ltd.....	1017 New Birks Building, Montreal.....	Eganville.
Dominion Sugar Co., Ltd.....	Chatham.....	Chatham. Wallaceburg.
Gallagher Lime and Stone Co., Ltd.....	James St., Hamilton.....	Hamilton.
Jamieson, J. M.....	Foresters Falls.....	Foresters Falls.
Jamieson Lime Co.....	Hall St., Renfrew.....	Renfrew.
Kinkley, H.....	Napanee.....	Napanee.
Robertson Co., Ltd., D.....	26 Queen St. East, Toronto 2.....	Milton.
Shane Lime Co.....	Eganville.....	Eganville.

Lime Industry—Concluded

Name	Address	Location
ONTARIO—Concluded—		
Standard White Lime Co., Ltd.	15 Douglas St., Guelph.	Beachville. Guelph.
Toronto Brick Co., Ltd.	897 Bay St., Toronto.	Coboconk.
Toronto Lime Co., Ltd.	26 Queen St. E., Toronto.	Limehouse.
Union Carbide Co. of Canada, Ltd.	46 King St. W., Toronto.	Welland.
Vogan, Samuel.	Gould St., Warton.	Warton.
Weppeler, Henry.	R.R. No. 2, Priceville.	Glenelg Tp.
MANITOBA—		
Gillis, Quarries Ltd.	Spruce and Richard Sts., Winnipeg.	Garson.
Manitoba Gypsum Co., Ltd.	Box 3057, Winnipeg.	Gypsumville.
Moosehorn Lime Co., Ltd., The.	214 Avenue Bldg., Winnipeg.	Moosehorn.
Winnipeg Supply and Fuel Co., Ltd.	214 Avenue Bldg., Winnipeg.	Stonewall.
ALBERTA—		
Loder's Lime Co., Ltd.	Kananaskis.	Kananaskis.
Summit Lime Works.	Box 273, Lethbridge.	1½ miles east of Crow's Nest.
BRITISH COLUMBIA—		
Hedley Gold Mining Co., Ltd.	Hedley.	Hedley.
Pacific Lime Co., Ltd.	744 Hastings St. W., Vancouver.	Blubber Bay, Texada Island.
Rosebank Lime Co.	744 Hastings St. W., Vancouver.	Esquimalt Harbour.

Sand and Gravel

NOVA SCOTIA—		
Campbell, J. J. & Son.	Boisdale.	Boisdale and Barra Glen.
MacNeil Bros.	Main St., Sydney Mines.	Sydney Mines.
Pictou County Contractors' Supply Co., Ltd.	Provost St., New Glasgow.	Lawrencetown.
Routledge, W. F.	Reserve Mines, Cape Breton.	Reserve Mines.
NEW BRUNSWICK—		
Canadian Independent Oil Co., Ltd.	P. O. Box 729, Saint John.	Saint John.
Likely, Jos. A.	Saint John.	East Saint John.
QUEBEC—		
Anglo-Canadian Pulp and Paper Co.	Limoilou, Quebec.	Limoilou.
Benoit, J. A.	Mont St. Gregoire.	Mont St. Gregoire.
Blais, Jos., Engr.	8 Mont-Marie Ave., Levis.	St. Romuald.
Bonner Sand and Ballast Ltd.	110 Bridge St., Montreal.	Durham Tp.
Brault, F. X.	St. Dominique de Bagot.	St. Dominique.
Brault, Wm.	16-1st Ave., Sherbrooke.	Orford Tp.
Brouillet Sand Co.	Rawdon.	St. Julienne.
Canadian Import Co.	83 Dalhousie St., Quebec.	St. Lawrence River.
Canadian International Paper Co.	Three Rivers.	Hull Tp.
Cauchon, Ed.	140-11th St., Quebec.	Mont Mills.
Cloutier, J. E.	100 Cartier St., Chicoutimi.	Chicoutimi.
Compagnie de Sable Ltée, La.	3rd Ave., Limoilou, Quebec.	St. Charles River.
Consolidated Sand Co., Ltd.	270 Ottawa St., Montreal.	St. Maurice River and Lake of Two Mountains.
Dubuc, J. E. A.	Chicoutimi.	Laterriere Tp.
Duke-Price Power Co., Ltd.	Roberval.	Arvida.
Gauthier, Isidore.	Riviere du Moulin, Chicoutimi.	Chicoutimi.
Horne Copper Corporation.	Noranda.	Rouyn.
Houde, Dr. Fred.	Notre Dame St., Three Rivers.	Three Rivers.
Independent Sand Co., Ltd.	4740 Iberville St., Montreal.	Montreal.
Lake St. John Power and Paper Co., Ltd.	Dolbeau.	Dolbeau.
Montreal, City of.	City Hall, Montreal.	St. Felix du Cap Rouge.
Montreal Harbour Commission.	Montreal.	Montreal Harbour.
Oka Sand and Gravel Co., Ltd.	248 McCord St., Montreal.	Lake of Two Mountains.
Paradis, Pitre.	Hebertville.	Hebertville.
Quebec Harbour Commission.	Quebec.	Wolfe's Cove and Charles River.
Raymond, Charles.	120 St. James St., Montreal.	Ste. Julienne.
Roads Department of Quebec.	Parliament Bldgs., Quebec.	
Sherbrooke, City of.	City Hall, Sherbrooke.	Orford Tp.
Sorel Sand Co.	82 Montcalm St., Sorel.	Sorel.
Standard Sand, Ltd.	Joliette.	Ste. Emelie Jct. and L'Epiphanie
Wright & Co.	250 Catherine St., Ottawa, Ont.	Hull.
ONTARIO—		
Armstrong Supply Co., Ltd.	1143 York St., Hamilton.	Hamilton.
Benson and Patterson.	Stamford.	Stamford.
Bruce, County of.	Box 201, Walkerton.	Bruce Co.
Cadwell Dredging Co., Ltd.	Windsor.	Point Pelee.
Campbellford, Town of.	Campbellford.	Campbellford.
Carleton, County of.	Court House, Ottawa.	Carleton Co.
Carroll Bros.	490 Ellicott Square, Buffalo, N.Y., U.S.A.	Sherkston.
Chatham Sand and Gravel Co.	Wellington St., Chatham.	Thames River.

Sand and Gravel—Concluded

Name	Address	Location
ONTARIO—Concluded		
Conlin, Herbert L.	129 Front St. E., Toronto	Highland Creek.
Dominion Concrete Co., Ltd.	Kemptville	(Near) Kemptville.
Dominion Towing and Salvage Co., Ltd.	714 Whalen Bldg., Port Arthur	Lake Superior.
Dowler Bros.	Billings Bridge	Billings Bridge.
Durham Sand and Stone Co., Ltd.	217 Bay St., Toronto	Durham.
Ellins, W.	Scarlett Rd., Toronto 9	York Co.
Empire Limestone Co.	19 Hudson St., Buffalo, N.Y., U.S.A.	Sherkston.
Essex Transit Co.	30 Sandwich St., Ford City	(Near) Sarnia.
Fineout, Geo. & Co.	Box 42, Port Arthur	Thunder Bay.
Foster, R. R.	278 Echo Drive, Ottawa	(Near) Ottawa.
Fuller Gravel, Ltd.	Ivanhoe	Fuller Station.
Godson Contracting Co., Ltd.	203 Richmond St. W., Toronto	Ontario Co.
Guelph, City of	Guelph	Guelph.
Harbour Brick Co., Ltd.	Fleet St., Toronto	Lake Ontario.
Harwich, Township of	Blenheim	Harwich Tp.
Hinde Bros.	134 Northlands Ave., Toronto	Toronto.
Homegardner Sand Co.	Sandusky, Ohio, U.S.A.	Lake Erie.
Huron, County of	Goderich	Huron Co.
Independent Concrete Pipe Co., Ltd.	Woodstock	Blandford and E. Zorra Tp.
Kent, County of	Chatham	Kent Co.
Kingston Sand and Gravel Co., Ltd.	183 William St., Kingston	(Near) Kingston.
Lake Erie Sand Co.	Sandusky, Ohio, U.S.A.	Lake Erie.
Lambton, County of	383 Christina St. N., Sarnia	Lambton Co.
Lapish and Small	Sault Ste. Marie, Mich., U.S.A.	Lake Superior.
Leviness, J. E.	R.R. No. 3, Niagara Falls	Stamford.
Lovelace, E. J.	St. Catharines	(Near) St. Catharines.
Maple Sand, Gravel and Brick Co.	454 King St. W., Toronto	Vaughan Tp.
McLean, A. B. and Sons	123 Spring St., Sault Ste. Marie	St. Mary's River.
Merlo, Merlo and Ray, Ltd.	Ford City	St. Claire River.
Middleton, County of	London	Middlesex Co.
Mohawk Sand and Gravel Co.	Box 336, Brantford	Brant Co.
Murray, J. J.	1382 Bridge St., Niagara Falls	Welland Co.
National Sand and Material Co., Ltd.	Welland	Lake Erie.
Ontario Department of Highways	Parliament Bldgs., Toronto	
Ontario Gravel Freightng Co., Ltd.	Box 189, Windsor	Point Pelee.
Peterborough, City of	133 Simcoe St., Peterboro.	Peterboro.
Quigley, B. C.	General Delivery, Hamilton	Bartonville.
Ratcliffe, E. B., Ltd.	King St., Bartonville	Bartonville.
Rogers, W. T.	510 Lumsden Bldg., Toronto	York Co.
Sand and Supplies, Ltd.	54 University Ave., Toronto	Waterloo Co.
Sebach, Ed.	R.R. No. 1, Sebringville	Perth Co.
Smythe, Con., Ltd.	11 King St. W., Toronto 2	Etobicoke Tp.
Spratt, J. H.	Billings' Bridge	Billings Bridge.
United Counties of Northumberland and Durham	Cobourg	Northumberland and Durham Counties.
Wellington, County of	Box 258, Guelph	Wellington Co.
Willox, Hervey	985 Bridge St., Niagara Falls	Stamford Tp.
Windsor Sand and Gravel Co., Ltd.	Walkerville	Leamington.
Wright & Co.	960 Queen St., Sault Ste. Marie	Korah Tp.
MANITOBA—		
Braid and McCurdy	136 Portage Ave., Winnipeg	Bird's Hill.
Brandon, City of	City Hall, Brandon	Brandon.
Building Products and Coal Co., Ltd.	Christie St., Winnipeg	Woodlands.
Cumming & Dobbie	Brandon	Brandon.
Cusson Lumber Co., Ltd.	St. Boniface	Ste. Anne.
Greater Winnipeg Water District	Winnipeg	Mile 80, G.W.W.D. Ry.
North West Gravel and Fuel Co.	Winnipeg	Bird's Hill.
Riley, W. J.	Molson	Molson.
SASKATCHEWAN—		
Mackenzie Supply Co., Ltd.	Box 107, Regina	Regina.
Weyburn Storage and Distributing Co.	Weyburn	Weyburn.
ALBERTA—		
Cristall Sand Co.	10187-103rd St., Edmonton	N.W. 1-26-63-23 W. 4.
Huff Gravel Ltd.	708 Tegler Bldg., Edmonton	Heatherdown.
Spoke, John C.	Perryvale	Perryvale.
BRITISH COLUMBIA—		
Cascade Rock and Gravel Co., Ltd.	False Creek, Vancouver	Seymour Reserve.
Deeks Sand and Gravel Co., Ltd.	101 First Ave. W., Vancouver	Porteau, Howe Sound and Seymour Creek.
Gilley Bros., Ltd.	902 Columbia St. W., New Westminster	Fraser River and Pitt Lake.
Hillside Sand and Gravel, Ltd.	1083 Main St., Vancouver	Howe Sound.
Producers' Sand and Gravel Co., Ltd.	1902 Store St., Victoria	Royal Bay.
Ross, G. W.	510 W., Hastings St., Vancouver	

Stone Quarrying Industry—Granite

Name	Address	Location
NOVA SCOTIA—		
Hoyt, C. M.	Middleton	Nictaux W.
Queensport Granite Co., Ltd.	Queensport	Queensport
Rice, Elmer	Lawrencetown	Nictaux W.
Rice, W. D.	Middleton	Nictaux W.
NEW BRUNSWICK—		
Granite Street Pavement and Construction Co., Ltd.	Evandale	Hampstead.
McGrattan, H. and Sons, Ltd.	St. George	St. George.
Meating, Epps, Company, Ltd.	St. George	St. George and Bayside.
Milne, Coutts & Co., Ltd.	St. George	St. George.
Mooney, B. & Sons, Ltd.	112 Queen St., Saint John	Queens Co.
O'Brien and Baldwin	St. George	Spoon Island. St. George.
QUEBEC—		
B. and R. Granite Quarry (Berry & Rediker)	Beebe	Stanstead Tp.
Bergeron, Joseph	Shawinigan Falls	Almaville.
Bergeron, P.	Chicoutimi West	Rang St. Ignace.
Bernier, Aug.	Roberval	Roberval.
Blackburn, D.	Rang St. Pierre, Chicoutimi	Chicoutimi.
Bourtonnais, J. A.	Vaudreuil	Rigaud. (Guenette.
Brodie's Limited	1070 Bleury St., Montreal	Mt. Johnson. Graniteville.
Brunet, Joseph	663 Cote des Neiges Rd., Montreal	Chatham Tp.
Chicoutimi, City of	Chicoutimi	Chicoutimi.
Cite de Grand'Mere	Hotel de Ville, Grand'Mere	Grand'Mere.
Cloutier Bros.	Beebe	Beebe.
Cozzolino, Thos.	Box 2, Arvida	Arvida.
Delwaide and Goffin	Box 315, Chicoutimi	Rang St. Thomas.
Dumas, Art. & Cie., Engr.	Rivière a Pierre	Rivière a Pierre.
Dumas & St. Pierre	Rivière a Pierre	Rivière a Pierre.
Duncan, Wm.	R.R. No. 1, Beebe	Beebe.
Haselton, Wm. M.	Beebe	Beebe.
Lacasse and Boulais	Beebe	Beebe.
Lake St. John Power and Paper Co., Ltd.	Dolbeau	Dolbeau.
Lacroix, Alphonse	St. Sebastien Station	St. Sebastien.
Leclerc, Edouard	St. Joachim	St. Joachim.
McIntosh, Robert	R.R. No. 1, Beebe	Beebe.
Norton, S. B.	Beebe	Stanstead Tp.
Page, T.	Chicoutimi	Bagotville.
Perron, Arthur	Rivière a Pierre	Rivière a Pierre.
Provincial Roads Department	Quebec	
Reed, R. M. and Son	R.R. No. 1, Beebe	Graniteville.
Riverin and Riverin, Engr.	Chicoutimi Centre	Bagotville.
Silver Granite Co., Ltd.	117 Cote d'Abraham, Quebec	St. Samuel Station.
Stanstead Granite Quarries Co., Ltd.	Beebe	Graniteville.
Voyer, F. et Frere	Rivière a Pierre	Rivière a Pierre.
Wilkinson, Frank L.	Beebe	Househill.
ONTARIO—		
Corporation of City of Fort William	City Hall, Fort William	Fort William.
Corporation of Town of Pembroke	Box 1025, Pembroke	Pembroke.
Farmer, Geo. and Sons	45 Bertrand St., Ottawa	Renfrew county.
Gordon, D. J., Granite Co.	239 Confederation Life Bldg., Toronto 2	Near Gananoque.
Henniger, M. G.	Smiths Falls	Escott Tp.
Horne, Wm., Granite Quarries	19 Welland Court, Winnipeg, Man.	Butler.
Mond Nickel Co., Ltd.	Coniston	Drury and Leveck Tps.
Ontario Rock Co., Ltd.	410 Crown Office Bldg., Toronto	Belmont and Methuen Tps.
Routly, H. T.	9 Richmond St. E., Toronto	Jarvis, Georgetown, Kincardine.
BRITISH COLUMBIA—		
B.C. Monumental Works, Ltd.	2250 Main St., Vancouver	Granite Island.
Coast Quarries, Ltd.	837 Hastings St. W., Vancouver	Granite Falls.
Cranbrook, City of	Cranbrook	East Kootenay District.
Gilley Brothers, Ltd.	902 Columbia St., New Westminster	Coquitlam Municipality.
Nelson, City of	Box 1028, Nelson	Nelson.
Nelson Granite and Monumental Co.	507 Front St., Nelson	Nelson.
Nelson, Jas.	Sirdar	Sirdar.
Poignant, C. E. and C. G.	Matsqui	Matsqui.
Vancouver Granite Co., Ltd.	543 Granville St., Vancouver	Nelson Island.
Vernon Granite and Marble Co.	Box 285, Vernon	Okanagan Landing.
Western Granite Co., Inc.	202 Lloyd Bldg., Seattle, Wash.	Ymir.
Wilson, James	Sirdar	Sirdar.

Stone Quarrying Industry—Limestone

Name	Address	Location
NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.	Sydney	Pt. Edward, C.B.
Eastern Lime Co. (H. C. Burchell)	Windsor	Windsor.
Kennedy & Porter	Box 601, Stellarton	Pictou.
NEW BRUNSWICK—		
Brookville Manufacturing Co.	Brookville	Brookville.
Peters, C. H., Sons, Ltd.	Ward St., Saint John	Torriburn.
Provincial Lime Co., Ltd.	89 Water St., Saint John	Lawlor Lake.
QUEBEC—		
Bathurst Co., Ltd.	Bathurst, N.B.	Port Daniel.
Beaudry, Joseph P.	Tache St. Joliette	Joliette.
Boileau, Ulric, Ltd.	Montreal	Cote-des-Neiges, Montreal.
Canada Carbide Co., Ltd.	Power Bldg., Craig St. W., Montreal	Bedford.
Canada Cement Co., Ltd.	Phillips Square, Montreal	Hull.
Charron, Arthur	Village Belanger	Village Belanger.
Chateau Richer Quarry, Ltd.	Chateau Richer	Chateau Richer.
Dept. of Justice	Ottawa, Ont.	St. Vincent de Paul, Cote St. Francois.
Dept. du Parc Maisonneuve	Hotel de Ville, Montreal	Maisonneuve.
Cite de Salaberry de Valleyfield	Valleyfield	City de Salaberry de Valleyfield.
Cousineau, Alderic	5697 St. Urbain St., Montreal	Montreal.
Delorimier and Rogers Quarry Co.	4901 Iberville St., Montreal	Montreal.
Deschambault Quarry Corp.	52 St. Paul St., Quebec	St. Marc des Carrieres.
Desormeaux, Edgar	2402 St. Hubert St., Montreal	Cap St. Martin.
Dominion Lime Co.	East Angus	Marbleton.
Duke Price Power Co., Ltd.	Arvida	St. Johns.
Dupre, Arthur	St. Michel	St. Michel.
Durocher, Cyrille	5383 Notre Dame St. E., Montreal	Montreal East.
Faubert, Alphonse	Ville de Lery	Ville de Lery.
Federal Stone Co.	339 Queen St., Ottawa	Hull.
Filion, Adolard	Lachute	Lachute.
Fraser-Brace Engineering Co., Ltd.	83 Craig St. W., Montreal	Paugan Falls.
Foundation Co. of Canada, Ltd.	746 Sherbrooke St. W., Montreal	Sicotte Tp.
Fuger and Smith, Ltd.	Pointe Claire	Pointe Claire.
Gagnon, Martin	7794 St. Andre St., Montreal	Montreal.
Gaspeian Fertilizer Co.	Port Daniel East	Port Daniel East.
Gauthier, Oliver	St. Marc des Carrieres	St. Marc des Carrieres.
Gingras Freres, Ltd.	St. Marc des Carrieres	St. Marc des Carrieres.
Giroux, J. H.	27 rue Plaisance, Three Rivers	St. Louis de France.
Gravel, Ed. L.	Chateau Richer	Chateau Richer.
Kennedy Construction Co., Ltd.	137 McGill St., Montreal	(Acton Vale.
La Cie de Calcaire de Chambord, Ltd.	Chambord Jet	(St. Francois de Sales.
Lapointe, Jos.	74 Montée St. Laurent, Cartierville	Chambord Jct.
Lapointe, Emile	St. Dominique De Bagot	Cartierville.
Laurentian Stone Co., Ltd.	250 St. Catherine St., Ottawa, Ont.	St. Dominique.
Laval Quarry Co., Ltd.	Cap St. Martin	Hull.
Lecrenier, V.	5110 Chabot St., Montreal	Cap St. Martin.
Maisonneuve Quarry Co., Ltd.	4415 Blvd. Rosemount, Montreal	Cap St. Martin.
Martineau, O. & Son, Ltd.	371 Marie Anne St. E., Montreal	Montreal.
Montreal Crushed Stone Co., Ltd.	2020 Union Ave., Montreal	Montreal.
Naud and Darveau	St. Marc des Carrieres	St. Vincent de Paul.
Noel, Oscar	41 Ledue St., Hull	St. Marc des Carrieres.
O'Connor Bros.	Box 101, Huntingdon	Wrightville.
Page, Jos.	Charlesbourg W.	Godmanchester Tp.
Paquette, Damien	Village Belanger	Charlesbourg W.
Paquette, Levi and Co.	Cap St. Martin	Cap St. Martin.
Quebec Quarry, Ltd.	Giffard, Beauport	Cap St. Martin.
Quinlan, Robertson and Janin, Ltd.	702 Sherbrooke St., Montreal	Giffard, Beauport.
St. Laurent Quarry, Ltd.	Cap St. Martin	Village Belanger.
St. Maurice Lime Co., Ltd. (in liquidation)	71 St. Peter St., Quebec	Cap St. Martin.
St. Michel Quarry, Ltd.	Ville St. Michel de Laval	St. Louis de France.
St. Vincent de Paul Penitentiary	St. Vincent de Paul	Ville St. Michel de Laval.
Société Coopérative Agricole de Calcaire de Mississquoi	Bedford	St. Vincent de Paul.
Standard Lime Co., Ltd.	Joliette	Stanbridge Tp.
Stone and Quarry, Ltd.	800 Bellechasse St., Montreal	St. Paul de Joliette.
Theoret, Magloire	Bellerive	(Montreal.
Therrien, Maxime	Belanger	(St. Francois de Sales.
Tremblay, Nap.	Joffre Ave., Hull	New Salaberry.
Varin et Martin	7775 St. Denis St., Montreal	Cap St. Martin.
Verreault, Elzear, Ltd.	194 rue du Pont, Quebec	Hull.
Villeray Quarry Co., Ltd.	848 du Rosaire St., Montreal	Cote St. Michel.
Wallace Sandstone Quarries, Ltd.	120 St. James St., Montreal	Giffard.
West End Quarry, Ltd.	Trois and Decelles Ave., Montreal	Montreal.
White Grit Co.	171 Waller St., Ottawa, Ont.	Phillipsburg.
Wright & Co.	250 Catherine St., Ottawa, Ont.	Portage du Fort.
ONTARIO—		
Barton Tp. Quarry	Court House, Hamilton	Hull.
Beachville White Lime Co., Ltd.	Beachville	Barton Tp.
Beverly Township Quarry	Rockton	Beachville.
Bolender Bros.	Haliburton	Beverly Tp.
Bourgie, J. B.	Embrun	Haliburton.
Brule, E. D. and Sons	Billings Bridge	Embrun.
		Hog's Back.

Stone Quarrying Industry—Limestone—Concluded

Name	Address	Location
ONTARIO—Concluded		
Brunner Mond, Canada, Ltd.	Amherstburg	Anderdon Tp.
Canada Cement Co., Ltd.	Montreal, P.Q.	Thurlow Tp.
Canada Crushed Stone Corp., Ltd.	Sun Life Bldg., Hamilton	Dundas.
Cartmell, John	Thorold	(Near) Thorold.
Cloutier & Grenon	Casselman	St. Isidore de Prescott.
Cook, J. S. & Son	Warton	Amabel Tp.
Corporation of the Town of Pembroke	Box 1025, Pembroke	Pembroke.
Crystallite Stone Products, Ltd.	Turner Bldg., Hamilton	Bancroft.
Dibblee Construction Co., Ltd.	758 Victoria Sq., Montreal, P.Q.	(Smiths Falls. Plantagenet. Alfred.
Dufferin Construction Co.	Fleet St., Toronto 2	Iroquois.
Foster, R. R.	278 Echo Drive, Ottawa	City View.
Gordon Crushed Stone Co., Ltd.	239 Confederation Life Bldg., Toronto	Hagersville.
Grant Bros. Construction Co., Ltd.	356 Bank St., Ottawa	(Near) Cardinal.
Grenville Crushed Rock Co., Ltd.	Merrickville	Oxford Tp.
Hagersville Contracting Co., Ltd.	72 Sun Life Bldg., Hamilton	Walpole Tp.
Hagersville Quarries, Ltd.	4 Flora St., St. Thomas	Walpole Tp.
Halliday, Fred A.	254a Elgin St., Ottawa	Gloucester Tp.
Humberstone Township Quarry	Humberstone	Humberstone Tp.
Irvine, E. Co., Ltd.	Alexandria	Selby.
Keeling, James	1179-16th St. E., Owen Sound	Owen Sound.
Kingdom Mining, Smelting and Mfg. Co., Ltd.	314 Beaver Hall Hill, Montreal, P.Q.	Galetta.
Kingston Penitentiary	Portsmouth	Portsmouth.
Kirkfield Crushed Stone, Ltd.	136 Confederation Life Bldg., Toronto 2	Kirkfield.
Langton, Thos.	Coldwater	Coldwater.
Law Construction Co., Ltd.	625 Confederation Life Bldg., Toronto 2	Melancthon and North Gower Tps.
Lincoln County Quarry	St. Catharines	Clinton Tp.
Longford Quarry Co., Ltd.	6 Peter St., Orillia	Rama Tp.
McGinnis & O'Connor	Kingston	(Rossmore. Cataraqui.
McKay, Alex., Stone Co., Ltd.	2 Brown's Ave., Toronto	Owen Sound.
Middleton, J. N.	Ancaster	Ancaster.
Neeapatyre Mineral and Products, Ltd.	506½ Victoria Ave., Port William	Fort William.
Oliver Rogers Stone Co., Ltd.	841 Fourth Ave. E., Owen Sound	Owen Sound.
Ontario Department of Highways	Parliament Bldgs., Toronto	Guelph Tp.
Ontario Reformatory Industries	Parliament Bldgs., Toronto	North Orillia.
Ontario Stone Corporation, Ltd.	305 Excelsior Life Bldg., Toronto 2	Grantham Tp.
Pirson, John	Stevensville	Niagara Tp.
Queenston Quarries, Ltd.	St. Davids	Crookston.
Quinlan, Robertson and Janin, Ltd.	702 Sherbrooke St. W., Montreal, P.Q.	(Near) Brockville.
Quinton & Brundige	Jasper	Gloucester Tp.
Robillard, H. & Son	195 Nicholas St., Ottawa	Kingston.
Roddy, J. M.	293 Division St., Kingston	(Jarvis. Georgetown. Kincardine.
Routly, H. T.	9 Richmond St. E., Toronto	Beachville.
Standard White Lime Co., Ltd.	15 Douglas St., Guelph	Finch Tp.
Stormont, Dundas and Glengarry, Counties of	Court House, Cornwall	Lindsay.
Wilford, F. R. & Co., Ltd.	Box 119, Lindsay	Stamford Tp.
Walker Bros.	Thorold	Dunn Tp.
Webber, John	Dunnville	Howe and Wolfe Islands.
Wehman, J.	251 Division St., Kingston	Humberstone Tp.
Welland County Quarry	Court House, Welland	St. Catharines.
Welland Ship Canal	St. Catharines	Barton and Binbrook Tps.
Welland Mining and Smelting Co. of Canada, Ltd.	Court House, Hamilton	Saltfleet Tp.
Wentworth, County of	72 Sun Life Bldg., Hamilton	Ridgeway.
Wentworth Quarries, Ltd.	625 Confederation Life Bldg., Toronto	Silver Mountain.
Windmill Point Crushed Stone Co., Ltd.	264 Berry St., St. Boniface, Man.	
Winnipeg Roofing Co.		
MANITOBA—		
Gillis Quarries, Ltd.	Spruce and Richard Sts., Winnipeg	Garson.
Tyndall Quarry Co., Ltd.	1591 Erin St., Winnipeg	Winnipeg.
Western Stone Co., Ltd.	St. Boniface	Garson.
Winnipeg, City of	Winnipeg	Stony Mountain.
ALBERTA—		
Summit Lime Works	Lethbridge	Lethbridge.
BRITISH COLUMBIA—		
Beale Limestone Quarries	Bella Bella	Cunningham Island.
British Columbia Pulp and Paper Co., Ltd.	Vancouver	Vancouver.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Fife.
Gough, C. W.	Kimberley	Kimberley.
Pacific Lime Co., Ltd.	602 Pacific Bldg., Vancouver	Texada Island.
Powell River Co., Ltd.	Powell River	Texada Island.
Wall, Thomas	Nelson	Nelson.
Wallen, J. J.	2303 Bridge St., Victoria	Quatsino Sound.

DOMINION BUREAU OF STATISTICS

Stone Quarrying Industry—Marble

Name	Address	Location
QUEBEC— Wallace Sandstone Quarry, Ltd.....	120 St. James St., Montreal.....	Phillipsburg, Mississquoi Co.

Stone Quarrying Industry—Sandstone

NOVA SCOTIA— Wallace Sandstone Quarries, Ltd.....	120 St. James St., Montreal, P.Q....	Wallace.
NEW BRUNSWICK— Dobson, Frank.....	Dorchester.....	Rockland.
Miramichi Quarry Co., Ltd.....	Quarryville.....	Quarryville.
QUEBEC— Blais, Jos., Enrg.....	8 Mont Marie Ave., Levis.....	Levis Co.
Gagnon, L. P.....	St. David.....	St. David.
Northern Construction Co., Ltd.....	612 Keefer Building, Montreal.....	Victoria Quarry Bridge. Quebec.
Faquet, Adolphe.....	St. David.....	Levis Co.
Roads Dept. of Quebec.....	Quebec.....	
Sherbrooke, City of.....	Sherbrooke.....	Ascot Tp.
Silico, Ltd.....	4 Hospital St., Montreal.....	St. Canute.
Vezina, Jos.....	Ste. Foy.....	Ste. Foy.
ONTARIO— Robertson, D. & Co., Ltd.....	26 Queen St. E., Toronto.....	Milton.
Rogers & Hurst.....	1181 Queen St. W., Toronto 3.....	Glen Williams.
BRITISH COLUMBIA— McDonald, J. A. and C. H.....	1571 Main St., Vancouver.....	Haddington Island. Newcastle Island.

APPENDIX ONE

EXPLANATORY NOTES

Method of Computing Values Shown in Reports on the Mineral Production of Canada.

For statistical and comparative purposes it has always been customary to determine the value of the metals on the basis of the quantities recovered from Canadian ores smelted during the year either in Canada or abroad; in making up values the general practice is, to use the average price of the refined metal in a recognized market. During 1926 some changes were made in the methods in use. The following notes have been prepared so that the reader may know how the figures for quantities and values have been computed.

Antimony.—Recoverable metal in shipments made, valued at the average New York price for the fine metal.

Arsenic.—(a) Recoverable arsenic in concentrates exported at an arbitrary value; (b) White arsenic shipped from Canadian smelters at its sales value.

Bismuth.—Recoverable bismuth metal in the silver-lead-bismuth bullion shipped to foreign smelters for refining, at an arbitrary value.

Cobalt.—Cobalt content of the various cobalt products sold by south Ontario smelters added to the cobalt content of ores and residues exported for treatment in foreign smelters: the value given is the net amount received by the shippers.

Copper.—1. Dominion Bureau of Statistics practice up to the end of 1925 was to include as the production of copper, data obtained from the following sources:—

- (a) Copper in matte made by the International Nickel Company and the Mond Nickel Company at their smelters in the Sudbury area;
- (b) Copper in cobalt-nickel and gold ores exported, deductions being made as follows:
 - (1) Copper in concentrates from gold ores less 26 pounds per ton of concentrates;
 - (2) Copper paid for in concentrates from silver-cobalt ores;
 - (3) Copper in concentrates exported (from Quebec) less 20 pounds per ton of concentrates;
 - (4) Blister copper produced at the Trail and Granby smelters;
 - (5) Copper in Britannia mine shipments of concentrates less 10 pounds per ton of concentrates;
 - (6) Copper in all other copper-bearing ores exported less 20 pounds per ton of concentrates.

2. The sum of production as thus determined was valued at the monthly average New York market price for electrolytic copper.

3. Consensus of opinion was that the foregoing method resulted in a higher valuation being put on copper production from Ontario ores than was actually obtained by Canadian producers, and it was held that practice in Ontario would be improved by measuring the copper production at its most advanced state within the province. Formerly, calculations were based on the copper content of matte made at the smelters in the Sudbury area; the method in use in 1926 and 1927 includes in the item "Production," the copper produced at Port Colborne and the copper in matte and ores exported.

- (a) There has been no change in method either in respect to quantities or values except in the province of Ontario; while it may be suggested that the production of copper from Trail ought to be measured at the refinery rather than at the smelter, it is not considered desirable to make this change at the present time, owing to the fact that the copper refinery in question operates only intermittently whereas the copper smelter has a more continuous record. There may be some disposition to discuss the deductions that ought to be allowed in connection with shipments of copper ores for export, but it is thought this possible change in practice would not be of great moment and it is therefore passed over at the present time;

APPENDIX ONE—Continued

(b) In computing Ontario's production of copper the procedure is as follows:—

- (1) Copper content of converter copper made at Port Colborne, the value for this output being computed *pro rata* according to the income from sales of copper during the year (as reported by the International Nickel Company of Canada);
- (2) Copper in matte exported from the smelters of the Sudbury area valued at an arbitrary figure agreed upon between the Bureau of Statistics and the Ontario Department of Mines;
- (3) Copper in concentrates from gold ores less 26 pounds per ton of concentrates valued at the monthly average New York price for electrolytic copper;
- (4) Copper paid for in concentrates from silver-cobalt ores exported, at its sales value as reported by the shippers.

Gold.—Gold in bullion produced and the recoverable gold in all other Canadian mine products valued at the standard rate of \$20.671834 per fine ounce.

Iron Ore.—Export tonnages and sales values.

Lead.—1. Dominion Bureau of Statistics practice up to the end of 1925 was to evaluate the recoverable lead from all sources at the average price prevailing on the Montreal market during the year.

2. Examination of the returns made to the Bureau shows that sales of lead in ores from the province of Quebec and to the extent of about 80 per cent of the lead sold from Trail, are made on the basis of London quotations; approximately 20 per cent of the lead sold from Trail is marketed in Canada.

3. Lead from Ontario ores finds its market in Canada.

4. Lead ores exported from British Columbia and from the Yukon to points in the United States are subject to a duty of $1\frac{1}{2}$ cents per pound of lead content (lead in base bullion takes a rate of $2\frac{1}{2}$ cents per pound). The difference between the London and New York quotations is approximately equivalent to the duty charge on each pound of lead imported into the United States.

In view of the foregoing facts the following procedure for the evaluation of lead from Canadian ores has been adopted:—

- (a) Ontario—Galletta sales, quantity and value.
- (b) Recoverable lead in ores exported from Quebec, Yukon and British Columbia as well as lead in base bullion made at Trail valued at the average London quotations during the year as given in the *Engineering and Mining Journal*, the English quotations being converted to Canadian funds at par (\$4.86666).

Molybdenite.—Shipments in terms of MoS_2 at their sales value.

Nickel.—Prior to 1925 it was customary in Dominion reports to compute the nickel production of Canada as the sum of the quantity of nickel contained in matte made at the Sudbury smelters and the nickel contained in smelter products from silver-cobalt ores; the value was computed at the average New York market price for virgin nickel. But as all Canada's nickel is derived from Ontario ores, and as the method used by the Ontario Department of Mines differed from Dominion Bureau of Statistics practice, a conference was arranged during 1925, with a view to harmonizing the statistics on nickel. As a result of this conference it was agreed that both offices should compute the quantity and value of nickel production as follows:—

- (a) Nickel in matte exported from Canada valued at an arbitrary figure agreed upon between the two offices—(representative of the value of nickel in matte);
- (b) Refined and electrolytic nickel produced at Canadian refineries valued at the average price obtained for such products sold during the year;
- (c) Nickel in nickel oxide or salts sold from Canadian smelters and refineries at its total selling value in the form in which it was sold;
- (d) Nickel contained in speiss residues exported, valued at the same price as allowed for nickel in matte.

APPENDIX ONE—*Concluded*

Precious Metals, including Platinum.—Recoverable metals in smelter products at their sales value to the producer.

Silver.—Silver bullion produced and the recoverable silver in other smelter products, and the recoverable silver in Canadian ores exported, at the average New York price for the refined metal.

Zinc.—Refined zinc produced at Trail and the recoverable zinc in concentrates exported, valued at the average monthly price quoted in London, exchange conversion being made at par.

Coal.—Output tonnage evaluated *pro rata* according to income from sales.

Other Non-Metallic Minerals, Clay Products and Structural Materials.—Shipments during the year at their respective sales values.

Imports.—Statements of quantities and values are based on the declarations of importers, as subsequently checked by government officials.

The value of imported merchandise is the fair market value or the price thereof when sold for home consumption in the principal markets of the country whence and at the time when the same were exported directly to Canada. The *price* and *value* of the goods in every case are stated as in condition packed ready for shipment, the fair value being shown in the currency of the country of export, and the selling price to the purchaser in Canada shown in the actual currency in which the goods were purchased. In the case of goods that are the manufacture or produce of a foreign country, the currency of which is substantially depreciated, the value stated is the value that would be placed on similar goods manufactured or purchased in the United Kingdom and imported from that country, if such similar goods are made or produced there. If similar goods are not made or produced in the United Kingdom, the value stated is the value of similar goods made or produced in any European country, the currency of which is not substantially depreciated.

Exports.—Statements of quantities and values are based on the declaration of exporters as subsequently checked by government officials.

The value of exports of Canadian merchandise is the actual cost or the value at the time of exportation at the points in Canada whence originally shipped.

Weight.—Weight, where shown in imports and exports is the net weight of the goods, excluding the weight of the covers or receptacles, except in the cases of certain goods, as provided in the tariff.

The expression *ton* means 2,000 pounds, and *cwt.* 100 pounds, avoirdupois. Where other units of quantity are used, imperial standards apply.

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STATISTICS OF MANUFACTURES—based chiefly on minerals.

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Production of Iron and Steel in Canada.

Coke Statistics for Canada.

Automobile Statistics for Canada.

SPECIAL REPORTS—

Report on the Consumption of Prepared Non-Metallic Minerals in Canada.

Report on the Consumption of Mine and Mill Materials in Canada.

Annual Summary Report on the Mineral Industry and the Manufacturing Industries Related Thereto.

Fertilizer Trade in Canada July 1, 1926—June 30, 1927.

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CANADA—DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF
CANADA

DURING THE CALENDAR YEAR

1928

Published by Authority of the Hon. H. H. Stevens, M.P.,
Minister of Trade and Commerce



OTTAWA
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1930

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A comprehensive record of the mining industry embodying historical and world data, detailed information on mineral production, imports and exports for Canada and general statistics relative to the mining industry on capital investment, employment, fuel consumption and power equipment arranged in 11 chapters each dealing with a particular branch of the industry. Statistics on production and trade in mineral products appear in detail in the appropriate chapters. A list of operating companies with their office and plant addresses is included. Fully indexed. Chapter titles are: Canada—The Provinces—The Gold Mining Industry—The Silver Mining Industry—The Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries—Directory of Reporting Firms—Notes on the Methods of Computing Values—Index.

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Monthly and Quarterly Reports on Coal and Coke Statistics for Canada.

A condensed report on production, imports and exports of coal and coke is issued monthly, publication being made about the fifteenth of the next following month.

A more general review is published quarterly, showing statistics for each month, for the quarter, and for the year to date on the output by coal-mining districts and by provinces, imports and exports by ports and by kinds of coal, employment in coal-mining, and tonnage lost. There is also a section on coke showing production, imports, exports, distribution and consumption by months and by provincial groups.

Annual Report on Coal Statistics for Canada.

Text and tables showing for Canada, and for each of the coal-producing provinces, historical and current data on output, tonnage lost, disposition of coal from the mines, domestic and foreign shipments, exports and imports by ports, consumption of coal, prices, employment, salaries and wages paid, power equipment, capital investment, etc.

Annual Bulletins—

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Metals.—Arsenic—Cobalt—Copper—Gold—Lead—Nickel—Metals of the Platinum Group—Silver—Zinc—Miscellaneous Metals including Aluminium, Antimony, Chromite, Iron ore, Manganese, Mercury, Molybdenum, Tin, Tungsten.

Non-Metals.—Abrasives—Asbestos—Coal—Feldspar—Gypsum—Iron Oxides—Mica—Natural Gas—Petroleum—Quartz—Salt—Talc and Soapstone—Miscellaneous Non-Metallic Minerals including Actinolite, Barytes, Fluorspar, Graphite, Magnesite, Magnesium Sulphate, Mineral Waters, Natro-Alunite, Peat, Phosphate, Pyrites, Sodium Carbonate, Sodium Sulphate.

Structural Materials.—Cement—Clay and Clay Products—Lime—Sand and Gravel Stone and Slate.

(b) MINERAL INDUSTRY.—Each bulletin of this group shows in synopsis, material to be published subsequently as one chapter of the annual report on the *Mineral Production of Canada*. These bulletins are published in mimeograph form from time to time during the year as the necessary material becomes available.

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By Provinces.—Nova Scotia — New Brunswick — Quebec — Ontario — Manitoba — Saskatchewan—Alberta—British Columbia—Yukon.

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DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH

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NOTES ON STATISTICS OF PRODUCTION

In the collection of production data, the Dominion Bureau of Statistics makes a division between primary and secondary production. In the first-named class, there are separate sections for the collection of statistics on (a) **Agricultural Products**, (b) **Furs**, (c) **Fish**, (d) **Forest Products**, (e) **Mineral Products**.

In the second are included (a) **Manufacturing** and (b) **Construction**.

Manufacturing is subdivided into nine groups of industries, producing concerns being classified according to the principal component material of their major products. For example, manufactures of leather goods are classified under "Animal Products"; the pulp and paper industry under "Wood and Paper," etc. An outline of the scheme of classification in use for manufacturing industries is given below:—

Manufactures of:

- (1) **Vegetable Products**, including—Coffee and Spices; Cocoa and Chocolate; Preserved and Canned Products; Pickles, Vinegar and Cider; Flour and Cereals; Bread and other Bakery Products; Macaroni and Vermicelli; Distilled and Brewed Liquors and Wines; Rubber Products; Starch and Glucose; Sugar; Tobacco Products; Linseed Oil and Oil Cake.
- (2) **Animal Products**, including—Fish and Fish Products; Dairy Factory Products; Meat and Meat Products; Leather and Leather Products; Furs and Fur Products.
- (3) **Textiles and Textile Products**, including—Cotton Textiles (Cloth, Yarn, Thread and Waste); Woollen Textiles (Cloth, Yarn, Blankets, Felt and Waste); Silk Products; Factory-Made Clothing, Carpets, Rugs and Mats; Cordage, Rope and Twine.
- (4) **Wood and Paper**, including—Pulp and Paper Mill Products; Paper Goods; Printing, Publishing and Lithographing; Saw and Planing Mill Products; Furniture, Carriages, Wagons and Sleighs; Wooden Containers; Woodenware; Turned Wood Products; and the Output of Similar Wood-Using Industries.
- (5) **Iron and Steel and their Products**, including—Pig Iron and Ferro-Alloys; Steel and Rolled Products; Castings and Forgings; Boilers, Tanks and Engines; Agricultural Implements; Machinery; Automobiles; Auto Parts and Accessories; Bicycles; Railway Rolling Stock; Wire and Wire Goods; Sheet Metal Products; Hardware and Tools; Miscellaneous Iron and Steel Products.
- (6) **Manufacture of Non-Ferrous Metals**, including—Aluminium Products; Brass and Copper Products; Lead, Tin and Zinc Products; Precious Metal Products; Electrical Apparatus and Supplies; Miscellaneous Non-Ferrous Metal Products; Non-Ferrous Smelting and Refining.
- (7) **Manufactures of the Non-Metallic Minerals**, including—Aerated Waters; Asbestos and Allied Products; Cement; Cement Products; Coke and Gas; Glass (blown, cut, ornamental, etc.); Lime; Petroleum Products; Products from Domestic Clays; Products from Imported Clays; Salt; Sand-Lime Brick; Stone, Dressing; Miscellaneous Non-Metallic Mineral Products, including (a) Artificial Abrasives and Abrasive Products, (b) Artificial Graphite and Electrodes, (c) Gypsum Products, (d) Mica Products, (e) Miscellaneous Non-Metallic Mineral Products, n.e.s.
- (8) **Chemicals and Allied Products**, including—Coal Tar Products; Acids, Alkalies, Salts and Compressed Gases; Explosives, Ammunition, Fireworks and Matches; Fertilizers; Medicinal and Pharmaceutical Preparations; Paints, Pigments and Varnishes; Soaps, Washing Compounds and Toilet Preparations; Inks, Dyes, and Colours; Wood Distillates and Extracts; Miscellaneous Chemical Products including (a) Adhesives, (b) Baking Powder, (c) Boiler Compounds, (d) Celluloid Products, (e) Flavouring Extracts, (f) Insecticides, (g) Polishes and Dressings, (h) Sweeping Compounds, (i) Chemical Products n.e.s.
- (9) **Miscellaneous Products**, including—Brooms and Brushes; Electric Light and Power; Musical Instruments, etc.

The statistics of manufactures are also classified according to the **use or purpose** of the end product as follows:—

- (1) **Food**, including—Breadstuffs; Fish; Nuts; Fruits and Vegetables; Meats; Milk Products; Oils and Fats; Sugar; Infusions; Miscellaneous.
- (2) **Drink and Tobacco**, including—Beverages, alcoholic; Beverages, non-alcoholic; Tobacco.
- (3) **Clothing**, including—Boots and Shoes; Fur Goods; Garments and Personal Furnishings; Gloves and Mitts; Hats and Caps; Knitted Goods; Waterproofs; Miscellaneous.
- (4) **Personal Utilities**, including—Jewellery and Time-Pieces; Recreational Supplies; Personal Utilities, n.e.s.
- (5) **House Furnishings**.
- (6) **Books and Stationery**.
- (7) **Vehicles and Vessels**.
- (8) **Producers' Materials**, including—Farm Materials; Manufacturers' Materials; Building Materials; General Materials.
- (9) **Industrial Equipment**, including—Farming Equipment; Manufacturing Equipment; Trading Equipment; Service Equipment; Light, Heat and Power Equipment; General Equipment.
- (10) **Miscellaneous**.

PREFACE

While the present report has been considerably reduced in size, the reduction has been made chiefly in the volume of text, and continuity has been maintained with previous reports of the series, in so far as the arrangement and nature of the tabular matter are concerned. It is thought the smaller volume will commend itself to the reader as being somewhat more convenient in form, than were the more bulky previous issues.

In each of the past three years, reports on the mineral production of Canada have disclosed new output records. Greater development has taken place in the production of both metals and non-metals than in almost any previous period. Revival of building operations consequent upon the rise in manufacturing activity, and the growth in the construction of private dwellings and new commercial establishments has given impetus to the industries producing structural materials such as bricks, lime and cement. Thus, throughout the mining industry there has been, for several years, notable evidence of strength and stability. While years ago, mining in Canada was regarded as a doubtful enterprise, the recent fulfilment of what were once regarded as extravagant claims, has done much to establish the industry in its proper place, relative to the other primary industries.

As in previous years, the Bureau has continued to work co-operatively in the collection of coal statistics with the provinces of Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia. Co-operative collection of general mineral production reports for the joint use of the Bureau and the provincial governments of Quebec, Ontario and British Columbia has also been continued on a mutually satisfactory basis. The Bureau desires to acknowledge its indebtedness in this respect and to thank the several provincial governments and other Dominion departments for valuable assistance rendered from time to time in connection with this report on the mining industry in Canada.

The thanks of the Bureau are also tendered to the mine and smelter operators, for assistance given and information made available. The railway and other transportation companies, as well as smelter operators outside of Canada, have also furnished data, the receipt of which is gratefully acknowledged.

The report has been prepared under the direction of Mr. S. J. Cook, B.A., A.I.C., F.C.I.C., Chief of the Mining, Metallurgical and Chemical Branch of the Bureau. Mr. W. H. Losee, B.Sc., had charge of the collection and compilation of the data, and was assisted by Mr. B. R. Hayden.

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DOMINION BUREAU OF STATISTICS, OTTAWA,

April 7, 1930.

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Table 1.—Quantities and Values of Mineral Products from Canadian Sources 1927 and 1928

			1927			1928		
			Quantity	Value	Per cent of total	Quantity	Value	Per cent of total
METALLICS								
Arsenic (As ² O ₃).....	lb.		6,227,968	\$ 211,979	0.08	5,432,223	\$ 193,052	0.07
Bismuth.....	lb.		2,072	1,003		14,002	5,067	
Cadmium.....	lb.					491,894	341,374	0.124
Cobalt.....	lb.		880,590	1,764,534	0.71	956,590	1,672,320	0.60
Copper.....	lb.		140,147,440	17,195,487	6.95	202,696,046	28,598,249	10.40
Gold.....	fine oz.		1,852,785	38,300,464	15.49	1,890,592	39,082,005	14.21
Iron ore sold for export.....	tons		2,029	8,980		2,244	6,732	
Lead.....	lb.		311,423,161	16,477,139	6.67	337,946,688	15,553,231	5.65
Nickel.....	lb.		66,798,717	15,262,171	6.17	96,755,578	22,318,907	8.11
Palladium, Rhodium, Iridium, etc.....	fine oz.		11,545	554,190	0.22	13,607	627,833	0.22
Platinum.....	fine oz.		11,228	717,613	0.29	10,532	708,909	0.25
Silver.....	fine oz.		22,736,698	12,816,677	5.18	21,936,407	12,761,725	4.64
Zinc.....	lb.		165,495,525	10,250,793	4.14	184,647,374	10,143,050	3.68
Total.....				113,561,030	45.98		132,012,454	48.00
NON-METALLICS								
Coal.....	tons		17,426,861	61,867,463	25.01	17,564,293	63,757,833	23.19
Natural gas.....	M cu. ft.		21,376,791	8,043,010	3.26	22,582,586	8,614,182	3.13
Peat.....	tons					1,497	5,845	
Petroleum, crude.....	brl.		476,591	1,516,043	0.60	624,184	2,035,300	0.74
Total.....				71,426,516	28.87		74,413,166	27.06
Actinolite.....	tons		86	1,075		70	875	
Asbestos.....	tons		274,778	10,621,013	4.30	273,033	11,238,360	4.09
Barytes.....	tons		56	1,268		127	2,847	
Bituminous sands.....	tons		2,706	10,824		94	374	
Diatomite.....	tons		266	6,650		368	8,960	
Feldspar.....	tons		29,849	259,151	0.10	31,897	284,942	0.10
Garnets.....	tons		2	150				
Graphite.....	tons		1,829	111,656	0.04	1,097	57,041	0.02
Grindstones.....	tons		2,251	125,017	0.05	1,855	100,960	0.04
Gypsum.....	tons		1,063,117	3,251,015	1.32	1,246,368	3,743,648	1.36
Iron oxides.....	tons		6,125	103,536	0.04	5,414	111,198	0.04
Magnesite.....	tons		7,337	230,309	0.09	13,195	346,990	0.13
Manganese, bog.....	tons					385	2,237	
Mica.....	tons		2,738	174,377	0.08	3,660	87,168	0.03
Mineral water.....	Imp. gal.		303,530	14,624		269,045	33,498	0.01
Natro-alumite.....	tons		7	248				
Phosphate.....	tons		151	1,717		641	8,276	
Pyrites.....	tons		50,893	198,388	0.08	38,589	321,033	0.12
Quartz.....	tons		233,984	496,364	0.21	282,522	523,933	0.19
Salt.....	tons		268,672	1,614,667	0.66	299,445	1,495,971	0.55
Silica brick.....	M		1,791	79,527	0.03	3,224	155,502	0.06
Soapstone.....	tons		1,411	57,174	0.02		40,171	0.01
Sodium carbonate.....	tons		805	9,995		519	4,922	
Sodium sulphate.....	tons		5,659	11,519		6,016	68,804	0.03
Talc.....	tons		15,110	178,931	0.07	14,925	179,187	0.07
Volcanic dust.....	tons		105	735		485	9,795	
Total.....				17,559,730	7.09		18,826,692	6.85
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS								
Brick—Soft mud process	Face.....	M	16,196	325,966	0.13	17,532	349,847	0.13
	Common.....	M	70,554	1,091,274	0.44	93,280	1,328,981	0.48
Stiff mud process	Face.....	M	95,480	2,024,064	0.81	101,717	2,247,472	0.82
	Common.....	M	150,222	2,239,180	0.90	144,404	2,182,307	0.79
Dry press.....	Face.....	M	39,753	833,570	0.33	36,587	748,301	0.27
	Common.....	M	14,617	187,062	0.07	24,294	337,096	0.12
Fancy or ornamental brick.....	M		620	29,372	0.01	599	28,763	0.01
Sewer brick.....	M		10,997	210,643	0.08	2,888	59,010	0.02
Paving brick.....	M		50	2,106		338	4,464	
Firebrick.....	M		5,388	246,266	0.09	4,940	234,460	0.09
Fireclay and other clay.....	tons		5,070	35,961	0.01	5,123	35,284	0.01
Kaolin.....	tons		24	120		5	25	
Fireclay blocks and shapes.....				100,659	0.05		105,091	0.04
Hollow blocks.....	tons		151,307	1,431,141	0.58	205,257	1,930,152	0.70
Roofing tile.....	No.		2,000	140		72,930	6,435	
Floor tile (quarries).....	sq. ft.		135,285	32,559	0.01	171,520	45,729	0.02
Drain tile.....	M		22,259	598,098	0.25	22,629	656,054	0.24
Sewer pipe, copings, flue linings, etc.....	tons		77,262	1,475,875	0.60		1,723,644	0.63
Pottery, glazed or unglazed.....				307,057	0.15		356,093	0.13
Bentonite.....	tons					20	100	
Other clay products.....				2,076			2,410	
Total.....				11,173,189	4.51		12,381,718	4.50
Cement.....	brl.		10,065,865	14,391,937	5.82	11,023,928	16,739,163	6.10
Lime.....	tons		444,763	3,923,388	1.58	508,889	4,534,568	1.65
Sand and gravel.....	tons		22,952,819	6,055,601	2.45	28,102,691	5,809,431	2.11
Stone—								
Granite.....	tons		730,049	1,383,557	0.56	1,195,810	2,366,946	0.86
Limestone.....	tons		6,438,379	7,145,917	2.89	6,949,420	7,267,437	2.64
Marble.....	tons		5,209	503,037	0.23	7,753	414,682	0.15
Sandstone.....	tons		132,799	232,793	0.10	100,951	223,236	0.08
Total.....				33,636,230	13.63		37,355,463	13.59
Grand total.....				247,356,695	100.00		274,989,487	100.00

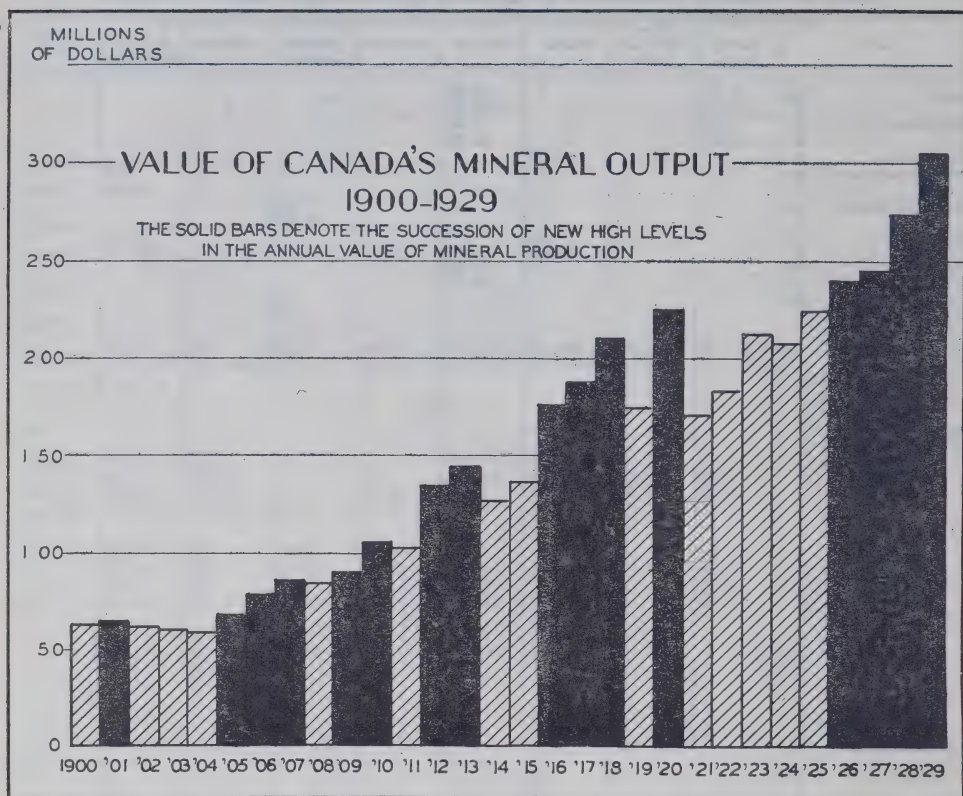
Table 2.—Increase or Decrease in Quantities and Values of Mineral Products from Canadian Sources in 1928 as Compared with 1927

		Increase (+) or Decrease (-)		Increase (+) or Decrease (-)	
		Quantity	per cent	Value	per cent
METALLICS					
Arsenic.....	lb.	— 795,745	— 12.8	\$ 18,927	— 8.9
Bismuth.....	lb.	+ 11,930	+ 575.7	+ 4,064	+ 405.1
Cadmium.....	lb.	+ 491,894	—	+ 341,374	—
Cobalt.....	lb.	+ 76,000	+ 8.6	+ 92,214	+ 5.2
Copper.....	lb.	+ 62,548,606	+ 44.6	+ 11,402,762	+ 66.3
Gold.....	fine oz.	+ 37,807	+ 2.0	+ 781,541	+ 2.0
Iron ore sold for export.....	tons	+ 215	+ 11.5	+ 2,248	+ 25.2
Lead.....	lb.	+ 26,523,527	+ 8.5	+ 923,908	+ 5.7
Nickel.....	lb.	+ 29,956,861	+ 44.8	+ 7,056,736	+ 46.2
Palladium, Rhodium, Iridium, etc.....	fine oz.	+ 2,062	+ 17.8	+ 73,643	+ 13.2
Platinum.....	fine oz.	+ 696	+ 6.2	+ 8,704	+ 1.3
Silver.....	fine oz.	+ 800,291	+ 3.5	+ 54,952	+ 0.5
Zinc.....	lb.	+ 19,151,849	+ 11.5	+ 107,743	+ 1.1
Total.....				+ 18,451,424	+ 16.2
NON-METALLICS					
Coal.....	tons	+ 137,432	+ 0.7	+ 1,890,370	+ 3.05
Natural gas.....	M cu. ft.	+ 1,205,795	+ 5.6	+ 571,172	+ 7.1
Peat.....	tons	+ 1,497	—	+ 5,845	—
Petroleum.....	brl.	+ 147,593	+ 30.9	+ 519,257	+ 34.2
Total.....				+ 2,986,644	+ 4.1
Actinolite.....	tons	— 16	— 18.6	— 200	— 18.6
Asbestos.....	tons	— 1,745	— 0.7	— 617,347	— 5.8
Barytes.....	tons	+ 71	+ 126.7	+ 1,579	+ 124.5
Bituminous sands.....	tons	+ 2,612	—	+ 10,450	—
Diatomite.....	tons	+ 102	+ 38.3	+ 2,310	+ 34.7
Feldspar.....	tons	+ 2,048	+ 6.8	+ 25,791	+ 9.9
Garnets.....	tons	+ 2	—	+ 150	—
Graphite.....	tons	— 732	— 41.1	— 54,615	— 49.0
Grindstones.....	tons	— 396	— 17.6	— 24,057	— 19.3
Gypsum.....	tons	+ 183,251	+ 17.2	+ 492,633	+ 15.1
Iron oxides.....	tons	+ 711	+ 11.7	+ 7,662	+ 7.4
Magnesite.....	tons	+ 5,858	+ 79.9	+ 116,681	+ 50.6
Manganese, bog.....	tons	+ 385	—	+ 2,237	—
Mica.....	tons	+ 922	+ 33.6	+ 87,209	+ 50.1
Mineral water.....	Imp. gal.	+ 34,485	+ 11.4	+ 18,874	+ 129.7
Natro-alunite.....	tons	+ 7	—	+ 248	—
Phosphate.....	tons	+ 490	+ 324.5	+ 6,559	+ 382.0
Pyrites.....	tons	+ 12,274	+ 24.2	+ 122,645	+ 61.7
Quartz.....	tons	+ 48,538	+ 20.7	+ 27,589	+ 5.5
Salt.....	tons	+ 30,773	+ 11.4	+ 118,696	+ 7.4
Silica brick.....	M	+ 1,433	+ 80.0	+ 75,975	+ 95.5
Soapstone.....	tons	— 286	— 35.6	— 17,003	— 29.8
Sodium carbonate.....	tons	+ 357	+ 6.3	+ 5,073	+ 50.8
Sodium sulphate.....	tons	+ 185	+ 1.3	+ 57,485	+ 507.9
Talc.....	tons	+ 185	—	+ 256	+ 0.1
Volcanic dust.....	tons	+ 380	—	+ 9,060	—
Total.....				+ 1,266,962	+ 7.2
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS					
Brick—Soft mud process—(Face.....)	M	+ 1,336	+ 8.2	+ 23,881	+ 7.3
Common.....	M	+ 22,726	+ 32.2	+ 237,707	+ 21.7
Stiff mud process (wire cut)—(Face.....)	M	+ 6,237	+ 6.5	+ 223,408	+ 11.0
Common.....	M	+ 5,818	+ 3.8	+ 56,873	+ 2.6
Dry press—Face.....	M	+ 3,166	+ 7.9	+ 85,269	+ 10.3
Common.....	M	+ 9,677	+ 66.2	+ 150,034	+ 80.2
Fancy or ornamental brick.....	M	+ 21	+ 3.4	+ 609	+ 2.1
Sewer brick.....	M	+ 8,109	+ 73.8	+ 151,633	+ 72.7
Paving brick.....	M	+ 288	+ 576	+ 2,358	+ 111.9
Firebrick.....	M	+ 448	+ 8.3	+ 11,806	+ 4.8
Fireclay and other clay.....	tons	+ 53	+ 1.0	+ 677	+ 1.9

Table 3.—Mineral Production of Canada, by Provinces, 1928—Concluded

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
Salt..... tons	19,604			279,841					
\$	118,342			1,377,629					
Silica brick..... M	1,627			1,597					
\$	69,179			86,323					
Soapstone..... \$			40,171						
Sodium carbonate..... tons								519	
\$								4,922	
Sodium sulphate..... tons						6,016			
\$						68,804			
Sulphur*..... tons			1,552	4,974				32,063	
\$			12,061	54,100				254,872	
Talc..... tons				14,925					
\$				179,187					
Volcanic dust..... tons						485			
\$						9,795			
Total.....	2,072,793	583,949	12,060,447	2,853,353	609,399	78,599	374	567,787	
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS									
Brick—									
Soft mud process—									
Face..... M	185	50	70	16,327			662	238	
\$	2,220	1,000	1,115	317,800			22,163	5,549	
Common..... M	1,016	1,951	18,576	45,793	13,253	100	8,121	4,470	
\$	13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526	
Stiff mud process (wire cut)—									
Face..... M	1,510		29,914	64,664	2,014	1,374	845	1,396	
\$	34,639		686,752	1,367,859	42,350	44,208	17,927	53,737	
Common..... M	6,137		99,014	23,711		9,981	3,479	2,082	
\$	77,193		1,542,576	383,687		114,106	33,352	31,393	
Dry press—									
Face..... M			2,492	29,182		432	4,481		
\$			66,842	581,609		12,426	87,424		
Common..... M			52	3,460	328		17,593	2,861	
\$			511	43,753	4,945		243,039	44,848	
Fancy or ornamental brick.... M			67	532					
\$			3,049	25,714					
Sewer brick..... M				2,621				267	
\$				49,547				9,463	
Paving brick..... M			301					37	
\$			3,241					1,223	
Firebrick..... M						713	84	4,005	
\$	10,799					40,582	4,507	178,572	
Fireclay..... tons	2,615	67				1,327		1,114	
\$	9,705	1,848				9,183		14,548	
Kaolin..... tons			5						
\$			25						
Bentonite..... tons								20	
\$								100	
Fireclay blocks and shapes..... tons	1,050	1,621				73,301		29,119	
Hollow blocks..... tons	11,254		40,607	112,887	2,100	10,120	18,432	9,857	
\$	132,594		441,107	983,005	25,710	81,202	166,142	100,392	
Roofing tile (quarries)..... No.				72,930					
\$				6,435					
Floor tile (quarries)..... sq. ft.			500	171,020					
\$			50	45,679					
Drain tile..... M	89		531	20,276	149	15	377	1,192	
\$	3,282		18,833	572,577	9,211	600	12,761	38,790	
Sewer pipe, copings, flue linings, etc.... \$	211,833		163,521	974,157			247,410	126,723	
Pottery, glazed or unglazed..... \$		37,045		98,119			220,929		
Other clay products..... \$			306	400		588		1,056	
Total.....	496,577	72,192	3,097,295	6,177,664	291,791	377,896	1,162,264	706,039	
Cement..... brl.			4,913,820	3,911,795	693,450		834,067	670,706	
\$			6,305,396	5,520,897	1,685,084		1,732,582	1,495,204	
Lime..... tons	36,154		114,130	277,186			6,672	35,149	
\$	175,876		130,784	2,467,843	319,699		69,558	473,996	
Sand and gravel..... tons	290,266		491,471	8,136,341	1,653,929	2,225,524	2,575,708	2,334,270	
\$	111,103		54,183	1,701,282	2,230,307	431,475	489,406	529,669	
Stone..... tons	121,168		46,332	2,992,192	4,581,929		5,010	271,439	
\$	213,775		142,981	4,849,200	4,041,568		24,740	391,820	
Total.....	500,754	327,948	13,752,660	14,260,615	2,875,006	431,475	2,316,316	2,890,689	
Grand total..	30,524,392	2,198,919	37,037,420	99,584,718	4,186,853	1,719,461	32,531,416	64,496,351	2,709,957

*Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.



During the thirty years embraced by the period 1900-29 inclusive, the annual value of Canada's mineral production has on no fewer than sixteen different occasions surpassed all previous marks. While the effect of the upward trend of prices must be taken into account, especially as regards the war period, this record is nevertheless a remarkable illustration of sustained growth. It stamps the mining industry as a foremost force in the march of Canadian development during the twentieth century.

The sheer increase in value—from less than \$65,000,000 in 1900 to well over \$300,000,000 in 1929—is amply impressive in itself. But the manner in which it has been attained is no less notable. There has been a great advance in variety of output. At the opening of the century gold and coal were the only two large items of Canada's mineral production, whereas the Dominion's present-day mining industry owes its magnitude not only to coal and gold, but to copper, nickel, lead, silver, zinc, asbestos, and, in short, to perhaps as wide a diversity of resources as any country affords to mining enterprise.

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ANNUAL REPORT ON THE MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR 1928

CHAPTER ONE

GENERAL REVIEW.—Canada's mineral production in 1928 reached the record total of \$274,989,487. This large sum surpassed the 1927 output of \$247,356,695 by \$27,632,792 or 11.1 per cent and represented a value of \$28.07 per capita.

Gains were general in all groups. Metallic mineral production totalled \$132,012,454 and showed a gain of 16.2 per cent over 1927; fuels reached a grand aggregate of \$74,413,160, an increase of 4.1 per cent; other non-metallics totalled \$18,826,692 which was more than 7.2 per cent over the previous year's output; clay products were valued at \$12,381,718 exceeding 1927 by 10.8 per cent; and other structural materials advanced to \$37,355,463 or 11 per cent above the total for the preceding year.

In 1928 the amount of capital employed in Canada's mining industry was reported as \$841,967,982; this sum included the money expended on plants and plant equipment of mines and smelters and the working cash assets of the operating companies. Employees in and about the mines, smelters, quarries, gas and oil wells, clay products plants and cement mills numbered 89,448 and salaries and wages paid amounted to \$115,954,022.

In 1886 the Dominion's mineral output value amounted to little more than \$10,000,000, or about \$2.23 per capita; in 1901, five years after the discovery of gold in the Yukon, production totalled nearly \$66,000,000 or \$12.16 per capita. Thereafter, production fell off to \$60,000,000 in 1904 but moved forward rapidly again with the development of the silver properties at Cobalt and the increased production of nickel at Sudbury. Of the 9 million dollar increase in 1905 over 1904 in the value of Canada's mineral production, 6.3 millions were obtained from Ontario mines and of this 3.3 millions represented the increase in value of nickel production and 1.3 millions was credited to the growth in Ontario's silver output.

From 1904 until 1918 the value of Canada's mineral production rose steadily, due partly to the gradual increase in demand for mineral products, but mostly to the discovery of the Porcupine goldfield in Ontario, and to the general increases in prices during the war years. Production declined in 1919 because of surplus stocks, but the boom year of 1920 caused prices to

rise again and the output in that year reached a value of nearly \$228,000,000. During the next few years conditions were less prosperous but research that had been carried on for some time on the refractory ores of the great Sullivan mine in British Columbia began to tell and in 1925 Canada's mineral production reached \$226,500,000 or only \$1·3 millions under the record attained in 1920, and \$17 millions over the total in 1924. Of the increase, \$8 millions came from advances in the lead output of British Columbia. Gains have been general throughout the list in recent years.

Canada's 1928 mine output, valued at \$274,989,487 was 30 per cent greater than the total in 1918; some 220 per cent in excess of the total recorded 20 years ago; and 620 per cent beyond the figure of 30 years ago.

In 1928 Canada stood first in the world's production of asbestos and nickel, second in the output of cobalt, third in gold and silver, fourth in lead and copper and sixth in zinc. Canada produced 94 per cent of the world's nickel, 70 per cent of the asbestos, about 50 per cent of the cobalt, 9·5 per cent of the gold, 8·5 per cent of the silver, 9·2 per cent of the lead, 5·1 per cent of the copper and 5 per cent of the zinc.

METALLICS.—Arsenic production was less than in 1927, caused by the low prevailing price and the decrease in the output of arsenical ores from Cobalt, Ontario, and Hedley, British Columbia.

Bismuth production in 1928 was considerably above that of the previous year and amounted to 14,002 pounds worth \$5,067. Metallic bismuth is made by the Deloro Smelting and Refining Company, Ltd., and it is also recovered by foreign refineries from lead-silver bullion shipped by this company.

Cadmium, produced commercially for the first time in Canada in 1928, was recovered by the Consolidated Mining and Smelting Company, Ltd., as a by-product of the ores treated at Trail.

Cobalt output showed an increase of 8·6 per cent in quantity but was 5·2 per cent lower in value than in the previous year. The world market for this metal at the present time is supplied by Canadian and African producers in about equal proportions.

Copper production was much greater in 1928, and for the first time exceeded the 100,000 ton mark. Quebec production rose 15,000 tons as a result of the full year's operation of the Noranda smelter which had been started on December 15, 1927. Ontario's output was greater by 10,000 tons on account of greater activity in copper-nickel mining, and British Columbia exceeded the previous year's record by 6,000 tons. Average prices for electrolytic copper at New York rose from 12·920 cents per pound in 1927 to 14·570 cents in 1928.

Gold production was greater by 2 per cent. Ontario produced less than in 1927; the Porcupine camp showed a decrease of 15 per cent but the Kirkland lake camp increased its output by 27 per cent. The loss in Ontario was compensated by the greater output from Quebec due to the smelting of the copper ores from the Horne mine which assay from \$3.50 to \$4.00 per ton in gold. British Columbia and Manitoba also showed a greater output of the yellow metal. Ontario contributed 83·5 per cent of the total output; British Columbia added slightly more than 10 per cent; Quebec yielded 3·2 per cent, and for the first time produced more than the gold fields of the Yukon which only accounted for about 2 per cent of the total for Canada in 1928. Manitoba's one mine accounted for 1 per cent and production from Nova Scotia and Alberta made up the remainder.

Lead production, mostly from the Consolidated Mining and Smelting Co. Ltd., of Trail, B.C., reached a new tonnage record; but due to lower prices, the total value was nearly 6 per cent less than in the preceding year. Canada's output of lead is many times in excess of domestic requirements; as a consequence the exports of lead to the Orient and to Europe are rather large items in the foreign trade of the Dominion.

Nickel output was 44.8 per cent higher than in 1927 and the value of nickel produced represented 8 per cent of the total mineral production for the year. Exports in the form of nickel-copper matte, the production of refined and electrolytic nickel and the output of nickel oxides and salts were all greater. Towards the end of 1928 the Mond Nickel Company and the International Nickel Company were merged into one organization. The large ore bodies hitherto operated by these two companies will be developed and mined with a unity of purpose and the resultant products of copper, nickel, gold, silver, and the metals of the platinum group will be marketed to the best possible advantage.

Silver output was 3.5 per cent less than in 1927 but as the average price was slightly higher the drop in total value was only 0.5 per cent. The Sullivan mine in British Columbia which is primarily a lead-zinc property produces more silver than any other Canadian enterprise. In 1928 this mine produced nearly 6,000,000 fine ounces; the Premier mine in the Portland canal district of British Columbia produced slightly under 2,500,000 fine ounces; ores shipped by the Treadwell Yukon Company of Mayo, Yukon Territory, contained slightly more than 2,500,000 fine ounces; Ontario produced 7,242,601 ounces, chiefly from the Nipissing, O'Brien and Mining Corporation properties of Cobalt, the Keeley mine and Frontier Lorrain in South Lorrain, and the Castle Tretheway and Miller Lake O'Brien in Gowganda.

Canadian zinc production in 1928 increased 11.5 per cent in quantity but owing to the decrease in the average price from 6.194 cents per pound in 1927 to 5.493 cents per pound in 1928, the total value was less than in 1927 by 1.1 per cent. Refined zinc was produced at the Trail smelter, and zinc concentrates were shipped from the Tetreault mine in Quebec to Belgian smelters. Small experimental shipments of zinc concentrates produced at the pilot mill of the Treadwell Yukon Company, Ltd., Bradley, Ont., were made to the Trail smelter and to the smelter at Kellogg, Idaho, U.S.A.

FUELS AND OTHER NON-METALLICS.—This group which includes coal, peat, natural gas and crude petroleum showed a gain of 4.1 per cent in value over the totals for 1928. Coal which is Canada's chief mineral product, represented 23.19 per cent of the total mineral output value in 1928. Production of coal constituted a record at 17,564,293 tons worth \$63,757,833 as against 17,426,861 tons valued at \$61,867,463 in 1927. The principal gain was in Alberta where a 6 per cent advance in production was recorded. Greater tonnages were also produced in New Brunswick, Saskatchewan and British Columbia. Nova Scotia's output was 4.7 per cent lower than in the preceding year.

Nova Scotia, New Brunswick, British Columbia and the Yukon produce bituminous coal; Saskatchewan mines yield lignite; Alberta produces bituminous, sub-bituminous and lignite.

Gains were recorded in the tonnages of lignite and sub-bituminous coal mined in Canada during 1928; the output of bituminous coal was slightly less than in 1927.

Imports of anthracite and bituminous coal from Great Britain during 1928 totalled 670,612 tons as against 928,544 tons imported in the previous year. While there does not seem to be anything particularly significant about the figures for bituminous coal imports from various sources, a study of the anthracite importations shows that the average quantity imported in each of the last five years amounted to about four million tons, further, the records for 1927 and 1928 showed a very appreciable increase in tonnages imported from Great Britain. In 1927, imports of anthracite from the United States totalled 3,265,411 tons; from Great Britain, 788,235 tons; and from other countries, 9,973 tons, making a total of 4,063,619 tons. During 1928, anthracite imports included 3,203,231 tons from the United States, 526,467 tons from Great Britain, and 7,635 tons from Belgium, British South Africa, the Netherlands and Russia. Imports from Russia amounted to 6,204 tons, shipments of anthracite being received in Canada from that country in December, 1928, for the first time.

Crude petroleum output in 1928 exceeded the totals for the previous year by 31 per cent in quantity and 34 per cent in value. In 1928 production amounted to 624,184 barrels worth \$2,035,300; in 1927 the total was 476,591 barrels valued at \$1,516,043. A larger output from the province of Alberta was mainly responsible for the increase. Geological investigations carried on in Alberta for several years have shown good results.

New Brunswick, Ontario, Alberta and to a very small extent, Manitoba, are the present sources of natural gas in Canada, New Brunswick and Ontario produced slightly larger quantities in 1928 but Alberta produced over 800,000,000 cubic feet more than in 1927 and yielded 63 per cent of the total Canadian output which amounted to 22,582,586,000 cubic feet worth \$8,614,182 as against 21,376,791,000 cubic feet worth \$8,043,010 in 1927.

Asbestos production, of which Canada supplies 70 per cent of the world's demand, amounted to 273,033 tons worth \$11,238,360, a decrease in quantity of 0.7 per cent from the 274,778 tons produced in the previous year but an increase in value of 5.8 per cent over the 1927 total of \$10,621,013.

Gypsum is another very important Canadian non-metallic mineral. In 1928 the output was a record and amounted to 1,246,368 tons worth \$3,743,648 as against 1,063,117 tons valued at \$3,251,015 in 1927. Of the gypsum producing provinces, Nova Scotia increased its output over 8 per cent, New Brunswick reported 10,000 tons less than in the previous year, Ontario showed a gain of nearly 2,000 tons, Manitoba's output was greater by 11,000 tons and British Columbia produced 3,600 tons less than the 1927 output.

Salt output was greater in both Nova Scotia and Ontario. Rock salt is mined in the Maritime province but in Ontario the output is derived from wells. The total production amounted to 299,445 tons worth \$1,495,971 as against 268,672 tons valued at \$1,614,667 in 1927; an increase of 11.4 per cent in quantity but a decrease of 7.4 per cent in value.

Other important non-metallics mined during the year were feldspar from Ontario and Quebec; grindstones from New Brunswick; magnesite from Quebec; quartz from Nova Scotia, Quebec, Ontario and British Columbia; and a small amount of rose quartz from Manitoba; sulphur in the form of pyrites from Quebec, Ontario and British Columbia and in sulphur gases from Ontario nickel-copper smelters; and talc from Ontario.

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS.—In the clay products and other structural materials industries increases were general, reflecting the increase in building operations during the year. Clay products as a group showed a gain of 10.8 per cent over 1927. The quantity of cement produced was greater by 9.5 per cent and the value increased 16.3 per cent. Lime production increased as did also sand and gravel though the value of the sand and gravel was slightly less than in the previous year. The stone group showed improvement on the whole; granite output gained 63.7 per cent in quantity and 71 per cent in value; limestone output was up 7.8 per cent in quantity and 1.7 per cent in value; marble output was 48.8 per cent greater in quantity but 17.6 per cent less in value and sandstone output was less in both quantity and value.

THE PROVINCES.—Nova Scotia, standing fifth among the mineral-producing provinces, yielded \$30,524,392 worth of metallic and non-metallic minerals and structural materials in 1928 which sum represented 11.10 per cent of the total for Canada. Coal was the chief mineral produced, the output representing 90 per cent of the total mineral output value of the province. Gypsum and salt were next in importance, followed by silica brick, clay products, gold, lime, stone and sand and gravel.

New Brunswick's output amounted to \$2,198,919 representing 0.8 per cent of Canada's total for the year. Coal, natural gas, gypsum, clay products and other structural materials were principal minerals produced. No metallic mineral production was reported in 1928.

Quebec moved from fifth place in 1927 to third place in 1928, producing \$37,037,420 worth of minerals and accounting for 13.47 per cent of Canada's total. The chief gain was in the metallic section where the values rose from \$2,408,057 in 1927 to \$8,127,018 in 1928. Copper production advanced from 3,119,848 pounds worth \$403,084 to 33,697,949 pounds worth \$4,909,791, and gold values increased from \$172,217 to \$1,240,434. Lead production was slightly less but zinc production showed an increase.

The non-metallic production from Quebec has always been greater than the metallic. The output of asbestos is mainly responsible for this fact and in 1928 sales of asbestos amounted to \$11,238,360 out of the total value of non-metallic production amounting to \$12,060,447. Other important non-metallic minerals marketed from Quebec were feldspar, graphite, iron oxides, magnesite, mica, mineral waters, quartz and pyrites. Clay products were valued at \$3,097,295; cement sales were greater than in any other province and reached a total of \$6,305,396. Lime, sand and gravel and stone were also very important products of this province.

Ontario was the outstanding mineral producing province; output from its mines reached a grand total of \$99,584,718 and represented 36.22 per cent of Canada's total. Metallics accounted for \$71,502,192; fuels, \$4,790,894; other non-metallics, \$2,853,353; clay products, \$6,177,664; and other structural materials, \$14,260,615. This province leads all others in the output of gold, is second in the production of copper, is the only province producing nickel, supplying 94 per cent of the world demand and produces a wide range of non-metallic minerals surpassing other provinces in sales of clay products, lime, sand and gravel, and stone.

Manitoba, with an output valued at \$4,186,853 in 1928 nearly doubled the total for the preceding year. One gold mine was in operation during the whole year but the output from the non-metallic and structural materials groups was responsible for the major part of the mineral production. In the district immediately north of The Pas, the Flin Flon and Sherritt Gordon copper-lead-zinc mines, with concentrating, smelting and power facilities, were being brought a step closer to the production stage. Manitoba will have a prominent place among the metal producing provinces of Canada when these properties are brought into production.

Saskatchewan's principal mineral is lignite coal, but there was also a production of sodium sulphate, clay products and sand and gravel. The total output for the province during the year was valued at \$1,719,461 as against \$1,455,225 in 1927.

Alberta stood first among the coal producing provinces of the Dominion in 1928. Natural gas production was double that of Ontario, and crude petroleum production was nearly four times greater than in Ontario. Of the \$32,531,416 output during the year, \$29,051,052 was credited to the fuels group, and of this latter amount, coal at \$23,532,414 accounted for 81 per cent. Bituminous sands was the only other non-metallic mineral reported; the value of clay products and other structural materials reached \$3,478,580.

British Columbia total at \$64,496,351 gave this province second place among Canada's provinces in the value of minerals produced in 1928, and represented 23.45 per cent of the grand total for the Dominion. This province yielded 50 per cent of Canada's copper and silver, 94 per cent of the lead and 88 per cent of the zinc; and 10 per cent of the Dominion total for gold. Coal is mined on Vancouver island, along the Crowsnest Pass and in different parts of the interior. Other British Columbia minerals include arsenic, cadmium, small amounts of cobalt, platinum and palladium, diatomite, pulpstones, gypsum, iron oxides, phosphate, pyrites, quartz, clay products, cement, lime, sand and gravel, and stone. Production in 1928 surpassed all previous records. The Sullivan mine has now become recognized as one of the greatest lead and zinc mines of the world and the silver found in association with these metals makes this mine the largest individual silver producer in Canada. The Trail plant is the largest non-ferrous smelter in the British Empire and the products are shipped to all parts of the world.

Yukon production valued at \$2,709,957 showed an increase over the preceding year of over 50 per cent. Gold, mostly from placers, and silver and lead from the Mayo district, were all higher than in 1928. The concentrator operated by the Treadwell Yukon Company, the

largest silver-lead producer in the district, does custom concentrating also and is of great assistance to small operators who have ore that is too low-grade to ship direct. The mining companies in this section of Canada cannot ship to outside smelters in the winter but must store the high-grade ore and concentrates until the opening of navigation in the spring.

The capital employed in Canadian mines in 1928 amounted to \$841,967,982 of which \$435,327,646 was invested in metal mining and metallurgical works; \$240,091,561 in coal mines and oil and gas wells; \$55,633,970 in other non-metal mining enterprises such as asbestos, feldspar, graphite, etc.; \$32,473,203 in the clay products industry; and \$78,441,602 in properties producing cement, lime, sand and gravel and stone.

Investments in coal mining and in gold quartz mining and milling each accounted for 17.5 per cent of the total capital employed in the mining industry; metallurgical works represented another 14 per cent; natural gas, 7 per cent; nickel-copper mining and cement manufacture about 5 per cent each; clay products about 4 per cent, and stone quarrying, 2 per cent. Ontario mines accounted for 39 per cent of the total investment in the industry. For the other provinces, the relative capital investments in mining expressed in percentages of the total for Canada were as follows: British Columbia, 19 per cent; Quebec, 16 per cent; Alberta, 14 per cent; Nova Scotia, 8 per cent; Manitoba, 2 per cent; the remaining 2 per cent represented the investment in the provinces of New Brunswick, Saskatchewan and the Yukon Territory.

Salaries and wages paid to 89,448 employees amounted to \$115,954,022 of which \$44,687,131 was distributed among 28,582 individuals in the metal mines and metallurgical works; 39,086 people employed by coal and other non-metals mines received \$54,089,011 and clay products and other structural materials industries had 21,780 employees who received \$17,177,880. In the metal mining and metallurgical group there was a marked and steady increase in the number employed during the past five years and in the total of fuels and other non-metallic mining industries the number employed was greater than in 1923, the last record year for this group. In the manufacture of clay products and in the production of cement, lime, sand and gravel and stone the total number of men was the largest in the past five years. More complete returns of sand and gravel production were obtained from the province of Quebec in 1926, 1927 and 1928 through co-operation with the Bureau of Mines and the Provincial Roads Department, Quebec.

The total cost of fuel and electricity used in the mining industry in Canada was \$23,432,001. This figure does not include the coke used in non-ferrous smelting furnaces which amounted to \$1,824,061 in 1928.

Products of the mines, smelters, quarries, sand pits, oil and gas wells, clay products and cement industries, in Canada during 1928 had a net value of \$279,820,914 as against \$251,077,661 in 1927 and \$190,845,547 in 1924. These figures must not be confused with the figures given as the value of mineral production; in calculating the mineral production values, the metals recovered from Canadian ores are valued at average annual prices for these metals in recognized world markets, but the figures given above represent the actual net return to the mines or metallurgical works regardless of the metal content of the shipments or the distance that the ore and other products must be shipped.

IMPORTS AND EXPORTS.—Imports into Canada during the calendar year 1928 of minerals and allied products reached a value of \$591,034,644 as against \$496,065,376 in 1927. These consisted of iron and its products valued at \$322,959,144, non-ferrous metals worth \$68,939,379, non-metallic minerals valued at \$162,172,427, and chemicals and allied products worth \$36,963,694. In the previous year imports of iron and its products were valued at \$248,151,554; non-ferrous metals, \$59,195,656, non-metallic minerals, \$155,404,666, and chemicals and allied products, \$33,313,500. Exports of similar products during the same period had a total value of \$218,894,546 as compared with \$199,086,788 in 1927. The 1928 exports of iron and its products were valued at \$70,665,677 as against \$67,831,374 in the previous year; non-ferrous metals, \$103,288,613 as against \$87,057,150; non-metallic minerals, \$26,583,611 as against \$26,343,349; and chemicals and allied products, \$18,356,645 as compared with \$17,854,915 during the year ending December 31, 1927.

An analysis of Canada's external trade in these four groups during 1928 shows that the value of imports from the United States made up 92 per cent of the total brought in from all foreign sources; 6.7 per cent of the value of purchases represented goods from the United Kingdom; and the remainder was derived from other countries, chief among which were: Belgium, Germany, Sweden, France, Switzerland and the Netherlands.

Of the total exports of these same groups, 42 per cent went to the United States and 30 per cent to the British Empire, of which the United Kingdom, Australia, British India and New Zealand were the largest purchasers. Among the remaining countries of the world, the largest importers were: Japan, Argentina, Germany, the Netherlands, China, France, Brazil, and Dutch East Indies.

The largest items among Canada's exports of iron and its products were automobiles and automobile parts valued at \$34,000,000 and farm implements worth nearly \$15,000,000; among the non-ferrous metals, gold and silver in the form of bullion and in ore was valued at over \$23,000,000; nickel in its various forms, \$22,000,000; pig lead and lead in ore, \$11,000,000; copper in blister form, in ores exported, scrap wire, etc., \$23,600,000; zinc spelter, in ore and zinc scrap, \$9,000,000; and aluminium in bars, blocks, scrap and in manufactured form, \$9,000,000.

Among the exports of the non-metallic mineral products, asbestos took first place at nearly \$11,000,000, followed by coal worth \$4,500,000; artificial abrasive exports amounted to over \$3,000,000, while crude petroleum and gypsum sent out of the country were each valued at more than \$1,000,000. Other important Canadian non-metallic minerals exported were feldspar and talc.

In the chemicals and allied products group the chief items exported were cyanamide at \$4,700,000; acetic acid, \$4,000,000; soda and soda compounds, \$3,700,000; and calcium carbide, \$800,000.

The Bureau's index number of articles of mineral origin, raw and partly manufactured, indicated lower price levels generally when compared with the base (1926 = 100). In January, 1928, the index for this group was 91.9. This figure held steadily throughout the first four months of the year after which date the figure was lowered to 90.7, prices generally became lower and the index number stood at 90.7 for July. From midsummer forward until the end of the year prices in this group improved, reaching 92.3 for November but fell off slightly to 91.5 in December. Chief among the influences affecting the index numbers were prices for scrap iron, non-ferrous metals, and wire and wire goods. Prices for lead and zinc were lower than in the previous year but average prices for copper and silver showed an improvement over 1927.

Table 4.—Exchange Table Showing the Amount Paid in Canadian Dollars for One United States Dollar by Months, 1924-1928

Month	1924	1925	1926	1927	1928
	\$	\$	\$	\$	\$
January.....	1-0275	1-0026	1-0020	1-0016	1-0018
February.....	1-0322	1-0014	1-0034	1-0016	1-0019
March.....	1-0294	1-0013	1-0037	1-0037	1-0000
April.....	1-0184	1-0005	0-9996	0-9990	0-9997
May.....	1-0166	1-0000	0-9992	0-9993	1-0009
June.....	1-0141	1-0000	0-9989	1-0003	1-0024
July.....	1-0064	0-9995	0-9987	1-0015	1-0021
August.....	1-0011	0-9995	0-9985	1-0006	1-0000
September.....	1-0078	1-0001	0-9986	0-9995	0-9996
October.....	1-0016	0-9992	0-9993	0-9999	1-0003
November.....	1-0000	0-9992	0-9986	0-9986	1-0999
December.....	1-0015	1-0003	1-0006	1-0010	1-0021
Average.....	1-0131	1-0003	1-0001	1-0005	1-0009

Table 5.—Metal Prices, 1924-1928

Commodity	Market	Unit	1924	1925	1926	1927	1928
			\$	\$	\$	\$	\$
Antimony (ordinaries).....	New York.....	Pound....	0-10836	0-17494	0-15988	0-12393	0-10305
Arsenic, white.....	New York.....	Pound....	0-09636	0-0466	0-0350	0-0383	0-04
Cobalt.....	New York.....	Pound....	2-75	2-50	2-50	2-50	2-63
Cobalt oxide.....	New York.....	Pound....	2-10	2-10	2-10	2-10	2-10
Copper.....	New York.....	Pound....	0-13024	0-14042	0-13795	0-12920	0-14570
	Montreal.....	Pound....	0-15155	0-1615	0-1577	0-1478	0-16402
	New York.....	Pound....	0-08097	0-09020	0-08417	0-06755	0-06305
Lead.....	Montreal.....	Pound....	0-08104	0-0912	0-08154	0-0673	0-0606
	Toronto.....	Pound....	0-08118	0-0919	0-08274	0-0683	0-06206
	London.....	Pound....	.....	0-07914	0-06751	0-05256	0-04576
Nickel.....	New York.....	Pound....	0-28	0-34	0-36	0-36	0-36
Platinum.....	New York.....	Ounce....	118-817	119-093	113-269	84-636	78-580
Silver.....	New York.....	Ounce....	0-66781	0-69065	0-62107	0-56370	0-58176
Tin.....	New York.....	Pound....	0-49674	0-56790	0-63615	0-62747	*0-50427
	St. Louis.....	Pound....	0-06344	0-07622	0-07337	0-06242	0-06027
Zinc.....	Montreal.....	Pound....	0-07837	0-0906	0-08825	0-07710	0-07144
	London.....	Pound....	0-0670	0-07956	0-07410	0-06194	0-05493

*Straits tin in 1928. Quotations on 99 per cent tin discontinued on April 1, 1928 because of absence of business.

Table 6.—Average Prices of the Principal Metals, 1898-1928 (a)

Year	Copper		Lead			Tin	
	Electrolytic	Standard				(f)	
	New York	London	New York	St. Louis	London	New York	London
1898.....	(b) 12.03	51.829	3.780	3.650	12.983	15.700	71.204
1899.....	16.670	73.687	4.470	4.340	14.933	25.120	122.429
1900.....	16.190	73.625	4.370	4.240	16.987	29.900	133.575
1901.....	16.110	66.983	4.330	4.200	12.521	26.740	118.633
1902.....	11.626	52.460	4.069	3.939	11.282	26.790	120.720
1903.....	13.235	57.970	4.237	4.107	11.579	28.090	127.320
1904.....	12.823	58.884	4.309	4.179	11.983	27.990	126.733
1905.....	15.590	69.465	4.707	4.577	13.719	31.358	143.083
1906.....	19.278	87.282	5.657	5.527	17.370	39.819	180.646
1907.....	20.004	87.007	5.325	5.195	19.034	38.166	172.638
1908.....	13.208	59.902	4.200	4.070	13.439	29.465	133.124
1909.....	12.982	58.732	4.273	4.153	13.042	29.725	134.774
1910.....	12.738	57.054	4.446	4.312	12.920	34.123	155.308
1911.....	12.376	55.973	4.420	4.286	13.970	42.281	192.353
1912.....	16.341	72.942	4.471	4.360	17.929	46.096	209.420
1913.....	15.269	68.335	4.370	4.238	18.743	44.252	201.679
1914.....	13.602	(c) 61.524	3.862	3.737	(c) 19.076	34.301	(c) 156.584
1915.....	17.275	72.532	4.673	4.567	22.917	38.590	163.960
1916.....	27.202	116.059	6.858	6.777	31.359	43.480	182.096
1917.....	27.180	124.892	8.787	8.721	30.500	61.802	237.563
1918.....	(d) 24.628	115.530	7.413	7.222	30.100	(e)	330.138
1919.....	18.691	90.796	5.759	5.530	28.590	63.328	257.601
1920.....	17.456	97.480	7.957	7.830	37.832	48.273	295.866
1921.....	12.502	69.356	4.545	4.363	22.752	28.576	165.285
1922.....	13.382	62.123	5.734	5.503	24.097	31.831	159.450
1923.....	14.421	65.840	7.267	7.141	27.147	41.799	202.148
1924.....	13.024	63.149	8.097	7.969	34.421	49.674	248.737
1925.....	14.042	61.920	9.020	8.817	36.429	56.790	260.974
1926.....	13.795	57.971	8.417	8.223	31.075	63.615	291.016
1927.....	12.920	55.653	6.755	6.511	24.192	62.747	288.953
1928.....	14.570	63.703	6.305	6.131	21.060	(e)	227.131

Year	Zinc		Antimony, New York	Quick- silver, New York	Aluminum, New York (g)	Silver, New York	Platinum, New York
	St. Louis	London					
1898.....	4.420	20.437	8.690	40.70	30.58	58.260	.....
1899.....	5.600	24.858	9.430	43.63	32.72	59.580	15.22
1900.....	4.240	20.274	9.500	51.00	32.72	61.330	18.09
1901.....	3.930	17.029	8.250	47.00	33.00	58.950	20.00
1902.....	4.690	18.545	6.120	48.03	33.00	52.160	19.00
1903.....	5.191	20.970	6.000	41.32	33.00	53.570	18.91
1904.....	4.931	22.591	6.371	41.00	35.00	57.221	19.50
1905.....	5.730	25.433	10.250	38.50	35.00	60.352	20.34
1906.....	6.048	27.020	21.730	40.90	35.75	66.791	28.04
1907.....	5.812	23.771	14.840	41.50	45.00	65.327	30.98
1908.....	4.578	20.163	8.004	44.84	28.70	52.864	16.32
1909.....	5.352	22.185	7.466	46.30	22.00	51.502	24.87
1910.....	5.370	23.050	7.386	47.06	22.25	53.486	32.70
1911.....	5.608	25.281	7.540	46.54	20.07	53.304	43.12
1912.....	6.799	26.421	7.760	42.46	22.01	60.835	45.55
1913.....	5.504	22.746	7.520	39.54	23.64	59.791	44.88
1914.....	5.061	(c) 22.544	8.763	48.31	18.63	54.811	45.14
1915.....	13.054	67.553	30.280	87.01	33.98	49.684	47.13
1916.....	12.634	72.071	25.370	125.49	60.71	65.661	83.40
1917.....	8.730	52.413	20.690	106.30	51.59	81.417	102.82
1918.....	7.890	54.180	12.581	123.47	33.53	96.772	105.95
1919.....	6.988	42.879	8.190	92.15	(e)	111.122	114.61
1920.....	7.671	44.372	8.485	81.12	32.72	100.900	110.90
1921.....	4.655	25.845	4.957	45.46	21.11	62.654	75.03
1922.....	5.716	30.003	5.471	58.95	18.68	67.528	97.62
1923.....	6.607	33.058	7.897	66.50	25.41	64.873	116.54
1924.....	6.344	33.728	10.836	69.76	27.03	66.781	118.82
1925.....	7.622	36.624	17.494	83.13	27.19	69.065	119.09
1926.....	7.337	34.105	15.988	91.90	26.99	62.107	113.27
1927.....	6.242	28.513	12.393	118.16	25.40	56.370	84.64
1928.....	6.027	25.284	10.305	123.51	23.90	58.176	78.58

(a) Authorities: Metallgesellschaft—London prices of copper, 1898-1901; of lead, 1898-1896; of zinc, 1898-1904; of tin, 1898-1913. American Metal Market—aluminum, 1922-1928. W. R. Ingalls—St. Louis lead, 1898-1908 and St. Louis zinc, 1898-1901. All other prices from Engineering and Mining Journal. (b) Lake copper. (c) Average of nine months; no quotations during August, September, and October. (d) Average of 11 months; no quotations in December. (e) No average computed. (f) 99 per cent tin. (g) Refer also to page 107.

Quotations for copper, lead, tin, zinc, antimony, and aluminum, in New York or St. Louis, are in cents per pound. Quicksilver prices are per flask of 75 lb. Silver is quoted in cents per ounce; platinum, dollars per ounce. All London quotations are given in pounds sterling per long ton.

From 1928 Year Book of the American Bureau of Metal Statistics.

Table 7.—Prices of Non-Metallic Minerals and Structural Materials, 1924-1928, Showing the Average Returns Received by Producers, f.o.b. Shipping Points in Canada as Computed from the Total Receipts and Total Shipments for the Year

Commodity	Unit	1924	1925	1926	1927	1928
		\$	\$	\$	\$	\$
NON-METALLICS						
Actinolite.....	Ton.....	13-60	12-50	12-50	12-50	12-50
Asbestos.....	Ton.....	29-73	30-95	36-14	38-65	41-16
Barytes.....	Ton.....	21-90	23-77	23-07	22-64	22-41
Bituminous sands.....	Ton.....	.....	4-00	4-00	4-00	4-00
Chromite.....	Ton.....	Transferred	to Metallics.		.....	.....
Coal.....	Ton.....	3-93	3-75	3-63	3-55	3-63
Diatomite.....	Ton.....	25-40	.....	.....	25-00	24-34
Feldspar.....	Ton.....	8-00	8-22	8-63	8-68	8-96
Fluorspar.....	Ton.....	17-66	4-94	.....	.....	.....
Garnets.....	Ton.....	.....	.....	.....	75-00	.....
Graphite.....	Ton.....	57-05	61-79	71-45	61-04	52-00
Grinding pebbles.....	Ton.....	.....	9-00	9-00	.....	.....
Grindstones.....	Ton.....	48-60	48-46	56-11	55-53	54-42
Gypsum (crushed).....	Ton.....	1-82	1-83	3-13	3-06	3-00
Iron Oxides.....	Ton.....	12-54	12-91	15-37	16-90	20-54
Magnesite.....	Ton.....	26-17	21-93	30-07	31-39	26-37
Magnesium sulphate.....	Ton.....	.....	.....	.....	.....	.....
Manganese.....	Ton.....	Transferred	to Metallics.		.....	5-81
Manganese, Bog.....	Ton.....	.....	.....	.....	.....	0-01
Mica (rough cobbled).....	Pound.....	0-06	0-05	0-04	0-03	.....
Mineral water.....	Gal.....	0-07	0-14	0-14	0-04	0-12
Natro-alunite.....	Ton.....	.....	50-00	.....	35-43	.....
Natural gas.....	M cu. ft.....	0-38	0-40	0-39	0-38	0-38
Peat.....	Ton.....	.....	6-12	.....	.....	3-90
Petroleum, crude.....	Brl.....	2-91	3-76	3-59	3-18	3-26
Phosphate.....	Ton.....	.....	11-81	20-00	11-37	12-90
Pyrites.....	Ton.....	.....	3-77	3-58	3-90	8-32
Quartz.....	Ton.....	2-14	1-84	2-38	2-12	1-85
Salt.....	Ton.....	6-61	6-04	5-63	6-00	4-99
Silica brick.....	M.....	.....	.....	.....	44-40	48-23
Sodium carbonate.....	Ton.....	.....	7-26	9-02	12-41	9-48
Sodium sulphate.....	Ton.....	5-54	5-06	2-00	2-00	11-43
Talc.....	Ton.....	13-63	14-22	13-77	14-29	12-00
Volcanic dust.....	Ton.....	.....	8-62	7-00	7-00	20-19
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement, portland and puzzolan.....	Brl.....	1-78	1-73	1-49	1-43	1-51
Clay products—						
Brick, common.....	M.....	.....	.....	.....	.....	.....
Brick, pressed.....	M.....	.....	.....	.....	.....	.....
Brick, hollow building.....	M.....	.....	.....	.....	.....	.....
Brick, moulded and ornamental.....	M.....	.....	.....	.....	.....	.....
Brick, face..... Soft mud process.....	M.....	17-10	18-83	19-71	20-67	19-95
Brick, common.....	M.....	14-89	11-20	14-65	16-44	14-25
Brick, face..... Stiff mud process, wire.....	M.....	22-86	20-06	21-24	21-19	22-09
Brick, common..... cut.....	M.....	15-09	14-08	17-26	14-90	15-11
Brick, face..... Dry press.....	M.....	21-60	21-50	21-40	20-96	20-45
Brick, common.....	M.....	13-13	12-24	13-40	12-79	13-87
Brick, fancy or ornamental.....	M.....	130-41	50-20	52-07	47-37	48-01
Brick, sewer.....	M.....	15-15	21-07	17-90	19-15	20-43
Firebrick.....	M.....	48-36	49-27	45-83	45-70	47-46
Fireclay.....	Ton.....	7-20	10-50	9-25	7-08	6-88
Hollow blocks.....	Ton.....	.....	9-46	9-25	9-45	9-40
Floor tile.....	Sq. ft.....	.....	0-20	0-22	0-24	0-26
Kaolin.....	Ton.....	.....	.....	.....	.....	5-00
Paving brick.....	M.....	.....	.....	41-10	42-12	13-20
Roofing tile.....	No.....	.....	0-08	0-09	0-07	0-03
Sewer pipe.....	Ton.....	20-87	19-51	19-48	19-10	.....
Tile, drain.....	M.....	27-04	27-59	27-77	26-86	23-99
Lime.....	Bush.....	0-34	0-33	0-32	0-30	0-31
Sand and gravel.....	Ton.....	0-28	0-29	0-28	0-26	0-21
Stone—						
Granite.....	Ton.....	2-41	2-07	1-48	1-89	1-93
Limestone.....	Ton.....	1-14	1-08	1-07	1-10	1-04
Marble.....	Ton.....	73-63	83-69	98-50	96-57	53-48
Sandstone.....	Ton.....	2-54	1-66	2-54	1-75	2-21

Table 8.—Annual Values of the Mineral Production of Canada, 1886-1928

Year	Value of production	Value per capita	Year.	Value of production	Value per capita
	\$	\$		\$	\$
1886.....	10,221,255	2.23	1907.....	86,865,202	13.75
1887.....	10,321,331	2.23	1908.....	85,557,101	13.16
1888.....	12,518,894	2.67	1909.....	91,831,441	13.70
1889.....	14,013,113	2.96	1910.....	106,823,623	14.93
1890.....	16,763,353	3.50	1911.....	103,220,994	14.32
1891.....	18,976,616	3.92	1912.....	135,048,296	18.33
1892.....	16,623,415	3.39	1913.....	145,634,812	19.35
1893.....	20,035,082	4.04	1914.....	128,863,075	16.75
1894.....	19,931,158	3.98	1915.....	137,109,171	17.44
1895.....	20,505,917	4.05	1916.....	177,201,534	22.05
1896.....	22,474,256	4.38	1917.....	189,646,821	23.18
1897.....	28,485,023	5.49	1918.....	211,301,897	25.37
1898.....	38,412,431	7.32	1919.....	176,686,390	20.84
1899.....	49,234,005	9.27	1920.....	227,859,665	26.40
1900.....	64,420,877	12.04	1921.....	171,923,342	19.56
1901.....	65,797,911	12.16	1922.....	184,297,242	20.55
1902.....	63,231,836	11.36	1923.....	214,079,331	23.41
1903.....	61,740,513	10.83	1924.....	209,583,406	22.71
1904.....	60,082,771	10.27	1925.....	226,583,333	24.19
1905.....	69,078,999	11.49	1926.....	240,437,123	25.61
1906.....	79,286,697	12.81	1927.....	247,356,695	25.99
			1928.....	274,989,487	28.07

Table 9.—Annual Values of the Mineral Production of Canada by Classes, 1907-1928 and by Provinces for 1928

Year	Metallics	Non-metallics including fuels	Clay products and other structural materials	Total
	\$	\$	\$	\$
Canada—				
1907.....	42,426,607	31,275,546	12,863,049	(a)86,865,202
1908.....	41,774,362	32,142,784	11,339,955	(a)85,557,101
1909.....	44,156,841	31,141,251	16,533,349	91,831,441
1910.....	49,438,873	37,757,158	19,627,592	106,823,623
1911.....	46,105,423	34,405,960	22,709,611	103,220,994
1912.....	61,172,753	45,080,674	28,794,869	135,048,296
1913.....	66,361,351	48,463,709	30,809,752	145,634,812
1914.....	59,386,619	43,467,229	26,009,227	128,863,075
1915.....	75,814,841	43,373,571	17,920,759	137,109,171
1916.....	106,319,365	53,414,983	17,467,186	177,201,534
1917.....	106,455,147	63,354,363	19,837,311	189,646,821
1918.....	114,549,152	77,621,946	19,130,799	211,301,897
1919.....	73,262,793	76,002,087	27,421,510	176,686,390
1920.....	77,939,630	108,027,947	41,892,088	227,859,665
1921.....	49,343,232	87,842,682	34,737,428	171,923,342
1922.....	61,785,707	82,976,794	39,534,741	184,297,242
1923.....	84,391,218	91,936,732	37,751,381	214,079,331
1924.....	102,406,528	71,796,009	35,380,869	209,583,406
1925.....	117,082,298	71,851,801	37,649,234	226,583,333
1926.....	115,237,581	85,240,144	39,959,398	240,437,123
1927.....	113,561,030	88,986,246	44,809,419	247,356,695
1928.....	132,012,454	93,239,852	49,737,181	274,989,487
By Provinces—1928—				
Nova Scotia.....	26,712	29,500,349	997,331	30,524,392
New Brunswick.....		1,798,779	400,140	2,198,919
Quebec.....	8,127,018	12,060,447	16,849,955	37,037,420
Ontario.....	71,502,192	7,644,247	20,438,279	99,584,718
Manitoba.....	410,597	609,459	3,166,797	4,186,853
Saskatchewan.....		910,090	809,371	1,719,461
Alberta.....	1,410	29,051,426	3,478,580	32,531,416
British Columbia.....	49,237,483	11,662,140	3,596,728	64,496,351
Yukon Territory.....	2,707,042	2,915		2,709,957
Canada.....	132,012,454	93,239,852	49,737,181	274,989,487

(a) Total includes \$300,000 allowed for products not reported.

Table 10.—Values of the Mineral Production of Canada by Provinces, 1899-1928

Year	Nova Scotia*	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1899.....	6,817,274	420,227	2,585,635	9,819,557		17,108,707		12,482,605	Included
1900.....	9,298,479	439,060	3,292,583	11,258,099		23,452,330		16,680,526	with
1901.....	7,770,159	467,985	3,759,984	13,970,010		19,297,940		20,531,833	Mani-
1902.....	10,686,549	607,129	3,743,636	14,619,091		16,127,400		17,443,031	toba,
1903.....	11,431,914	580,495	3,585,938	14,160,033		14,082,986		17,899,147	Saskat-
1904.....	11,212,746	559,913	3,688,482	12,582,843		12,713,613		19,325,174	chewan
1905.....	11,507,047	559,035	4,405,975	18,833,292		11,387,642		22,386,008	and
1906.....	12,894,303	646,328	5,242,058	25,111,682		10,092,726		25,299,600	Alberta
1907.....	14,532,040	664,467	6,205,553	30,381,638	898,775	533,251	4,657,524	25,656,056	8,335,898
1908.....	14,487,108	579,816	6,372,949	30,623,812	584,374	413,212	5,122,505	23,704,035	8,669,290
1909.....	12,504,810	657,035	7,086,265	37,374,577	1,193,377	456,246	6,047,447	22,479,006	4,032,678
1910.....	14,195,780	581,942	8,270,136	43,538,078	1,500,359	498,122	8,996,210	24,478,572	4,764,474
1911.....	15,409,397	612,830	9,304,717	42,796,162	1,791,772	636,706	6,662,673	21,299,305	4,707,432
1912.....	18,922,236	771,004	11,656,995	51,985,876	2,463,074	1,165,642	12,073,589	30,076,635	5,933,242
1913.....	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	881,142	15,054,046	28,086,312	6,276,737
1914.....	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	712,313	12,684,234	24,164,039	5,418,185
1915.....	18,088,342	903,467	11,619,275	61,071,287	1,318,387	451,933	9,909,347	28,689,425	5,057,708
1916.....	20,042,262	1,118,187	14,406,598	80,461,323	1,823,576	590,473	13,297,543	39,969,962	5,491,610
1917.....	21,104,542	1,435,024	17,400,077	89,066,600	2,628,264	860,651	16,527,535	36,141,926	4,482,202
1918.....	22,317,108	2,144,017	19,605,347	94,694,093	3,120,600	1,019,781	23,109,987	42,935,333	2,355,631
1919.....	23,445,215	1,770,945	21,267,947	67,917,998	2,868,378	1,521,964	21,087,582	34,865,427	1,940,934
1920.....	34,130,017	2,491,787	28,886,214	81,715,808	4,223,461	1,837,468	33,586,456	39,411,728	1,576,726
1921.....	28,912,111	1,901,505	15,157,094	57,356,651	1,934,117	1,114,220	30,562,229	33,230,460	1,754,955
1922.....	25,923,499	2,263,692	17,647,939	65,866,029	2,258,942	1,255,470	27,872,136	39,423,962	1,785,573
1923.....	29,648,893	2,462,457	20,308,763	80,825,851	1,768,037	1,047,583	31,287,536	43,757,388	2,972,823
1924.....	23,820,352	1,969,260	19,136,504	86,398,656	1,534,249	1,128,100	22,344,940	52,298,533	952,812
1925.....	17,625,612	1,743,858	24,284,527	87,980,436	2,276,759	1,076,392	25,318,866	64,485,242	1,791,641
1926.....	28,873,792	1,811,104	25,956,193	84,702,296	3,073,528	1,193,394	26,977,027	65,622,976	2,226,813
1927.....	30,111,221	2,148,535	28,870,403	99,982,962	2,888,912	1,455,225	29,309,223	60,801,170	1,789,044
1928.....	30,524,392	2,198,919	37,037,420	99,584,718	4,186,853	1,719,461	32,531,416	64,496,351	2,709,957

*Includes a small production from Prince Edward Island.

Table 11.—Percentage of the Total Value of the Mineral Production of Canada Produced by Each Province, 1924-1928

Province	1924	1925	1926	1927	1928
Nova Scotia*.....	11.38	7.78	12.01	12.17	11.10
New Brunswick.....	0.94	0.77	0.75	0.87	0.80
Quebec.....	9.12	10.72	10.79	11.67	13.47
Ontario.....	41.29	38.82	35.23	36.38	36.22
Manitoba.....	0.73	1.01	1.28	1.17	1.52
Saskatchewan.....	0.54	0.48	0.50	0.50	0.63
Alberta.....	10.61	11.17	11.22	11.85	11.83
British Columbia.....	24.94	28.46	27.29	24.58	23.45
Yukon.....	0.45	0.79	0.93	0.72	0.98
Canada.....	100.00	100.00	100.00	100.00	100.00

*Includes a small percentage from Prince Edward Island.

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1924-1928

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
Metal Mining Industry							
ALLUVIAL GOLD							
1924.....	89	1,404	21,871,256	264	389,079	.....	1,038,013
1925.....	99	1,419	22,095,669	363	347,448	.....	1,270,419
1926.....	108	1,179	4,702,808	285	339,841	44,482	879,886
1927.....	94	96	9,653,723	321	472,596	30,834	794,033
1928.....	82	82	10,384,575	342	538,270	57,178	852,735
AURIFEROUS QUARTZ							
1924.....	70	70	83,982,765	6,738	10,500,140	1,559,406	31,298,107
1925.....	52	52	84,964,062	7,052	11,931,948	1,836,050	35,035,361
1926.....	60	60	103,945,022	7,663	12,340,623	2,083,811	35,171,661
1927.....	72	76	118,381,468	8,022	12,935,719	2,222,085	37,452,995
1928.....	98	100	147,693,710	9,066	14,615,990	2,554,657	36,655,330
COPPER-GOLD-SILVER							
1924.....	15	15	19,099,845	2,118	3,292,228	366,153	5,226,859
1925.....	40	41	23,200,580	2,374	3,555,844	413,767	7,758,990
1926.....	76	84	27,936,685	3,403	4,546,493	541,914	9,973,049
1927.....	118	125	24,232,169	4,083	5,260,095	596,137	9,822,881
1928.....	164	174	50,004,340	4,777	6,764,309	731,836	15,281,519
SILVER-COBALT							
1924.....	26	34	41,013,466	1,769	2,534,304	468,651	6,594,032
1925.....	33	38	44,045,619	1,788	2,576,414	498,874	6,611,644
1926.....	33	37	40,504,721	1,779	2,815,930	518,907	5,470,433
1927.....	23	26	30,123,645	1,458	2,178,163	472,548	4,760,546
1928.....	15	19	22,027,683	1,166	1,809,466	430,683	3,938,884
SILVER-LEAD-ZINC							
1924.....	82	94	12,328,511	1,936	2,943,635	474,343	16,600,970
1925.....	89	94	15,735,930	2,538	3,867,613	584,121	21,902,686
1926.....	108	127	22,699,417	2,924	4,431,730	658,679	26,190,034
1927.....	157	173	28,036,330	3,106	4,807,817	588,520	17,520,130
1928.....	132	150	38,894,892	3,680	5,531,634	671,564	17,123,455
NICKEL-COPPER							
1924.....	3	7	37,189,778	1,421	1,880,823	150,460	4,235,934
1925.....	2	6	38,691,594	1,412	1,867,217	105,570	3,794,244
1926.....	2	6	38,593,359	1,437	1,963,617	95,621	4,627,175
1927.....	2	6	39,272,609	1,617	2,486,313	120,686	5,223,668
1928.....	4	8	45,659,704	1,963	3,136,838	121,005	5,831,640
(a) MISCELLANEOUS							
1924.....	4	4	5,000	42	16,436	4,010	71,422
1925.....	3	3	109,583	33	17,301	2,007	23,110
1926.....	2	2	87,588	25	10,626	3,844	11,072
1927.....	5	5	641,600	65	23,944	460	8,980
1928.....	5	5	627,000	62	61,886	8,880	6,732
NON-FERROUS METAL SMELTING AND REFINING							
1924.....	7	9	66,337,664	5,521	8,136,251	4,765,483	21,760,273
1925.....	5	6	61,691,928	5,104	8,568,997	5,280,674	29,304,384
1926.....	7	9	81,779,240	6,226	9,584,938	6,076,627	33,615,909
1927.....	8	10	85,366,682	7,671	12,120,240	6,380,127	45,479,578
1928.....	8	10	120,035,742	7,526	12,228,738	5,180,770	61,080,477

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries,
1924-1928—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries
			\$		\$	\$	\$
Total Metal Mining Industries							
1924.....	296	1,637	281,828,285	19,809	29,692,896	7,788,506	86,825,610
1925.....	323	1,659	290,534,965	20,664	32,732,782	8,721,063	105,700,838
1926.....	396	1,504	320,248,840	23,742	36,033,798	10,023,885	115,939,119
1927.....	479	517	335,798,206	26,343	46,284,887	10,411,397	121,062,811
1928.....	508	548	435,327,646	28,582	44,687,131	9,756,573	140,770,772
Non-Metal Mining Industries including Fuels							
(b) FUELS							
COAL							
1924.....	451	520	146,711,531	27,183	35,123,490	4,358,987	50,633,113
1925.....	450	511	145,006,440	25,032	33,200,309	4,069,634	46,835,788
1926.....	433	457	148,278,315	28,368	35,841,796	4,631,691	56,494,375
1927.....	385	437	146,392,808	29,772	38,955,967	3,558,926	58,439,742
1928.....	380	427	146,835,825	30,256	43,320,811	3,679,721	60,462,687
NATURAL GAS							
1924.....	186	2,031	50,561,757	1,240	1,315,405	3,059	5,512,570
1925.....	161	2,236	48,895,802	1,059	1,206,875	13,396	6,588,424
1926.....	169	2,255	57,231,261	1,254	1,448,778	40,444	7,350,170
1927.....	172	2,290	56,777,091	1,342	1,535,498	11,181	7,689,916
1928.....	155	2,073	62,073,384	1,660	2,105,648	34,396	7,216,054
PETROLEUM							
1924.....	119	2,473	5,650,086	158	152,957	18,656	467,400
1925.....	180	2,885	7,954,722	259	318,101	20,990	1,250,705
1926.....	210	2,822	17,639,142	634	788,843	77,902	1,311,665
1927.....	206	2,734	22,773,916	781	1,120,224	112,763	1,516,043
1928.....	190	2,763	31,182,352	1,118	1,916,625	205,183	2,807,528
TOTAL FUELS							
1924.....	756	5,024	202,923,374	28,581	36,591,852	4,380,702	56,613,083
1925.....	791	5,652	201,866,964	26,350	34,725,255	4,104,020	54,674,917
1926.....	812	5,534	223,148,718	30,256	38,079,417	4,760,087	65,166,210
1927.....	763	5,461	225,943,816	31,895	41,611,689	5,682,870	67,645,701
1928.....	725	5,263	240,091,561	33,034	47,343,084	5,919,300	70,486,269
OTHER NON-METAL MINING INDUSTRIES							
ABRASIVES							
1924.....	5	5	156,095	76	64,312	5,260	130,824
1925.....	8	8	154,733	62	55,466	5,408	126,490
1926.....	8	8	358,342	102	90,069	9,716	152,433
1927.....	7	9	433,810	132	107,603	10,279	132,552
1928.....	9	9	448,618	163	96,558	12,998	119,715
ASBESTOS							
1924.....	15	15	43,216,966	2,597	2,977,304	760,046	6,710,830
1925.....	14	19	38,133,046	2,582	2,997,107	923,239	8,988,360
1926.....	8	16	34,905,096	2,797	3,544,097	1,012,232	10,099,423
1927.....	7	13	35,316,821	2,976	3,761,192	1,046,541	10,621,013
1928.....	7	14	35,705,212	3,170	3,989,644	1,177,715	11,238,360

Table 12.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1924-1928—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER NON-METAL MINING INDUSTRIES—Continued</i>							
FELDSPAR							
1924.....	25	25	953,525	290	223,937	16,806	358,540
1925.....	23	25	712,329	240	165,766	11,141	235,789
1926.....	29	30	582,350	410	213,571	14,654	310,238
1927.....	29	29	322,978	234	151,553	10,232	259,151
1928.....	20	21	237,400	223	144,660	12,898	284,942
GRAPHITE							
1924.....	4	4	647,947	75	55,449	12,163	76,117
1925.....	6	6	902,310	106	75,021	14,718	158,763
1926.....	3	3	1,132,273	68	63,064	10,804	194,860
1927.....			Included with "a"	Miscellaneous "a"			
1928.....							
GYPSUM							
1924.....	14	15	4,423,697	1,219	1,114,468	181,003	2,208,108
1925.....	15	16	4,506,995	1,039	1,018,585	189,649	2,389,891
1926.....	18	19	6,696,077	1,368	1,255,427	241,414	2,770,813
1927.....	19	23	9,055,624	1,427	1,311,688	198,199	3,251,015
1928.....	16	22	8,035,319	1,159	1,171,814	242,260	3,743,648
IRON OXIDES							
1924.....	5	5	193,633	38	33,221	16,815	91,160
1925.....	5	5	173,940	47	35,454	16,073	91,913
1926.....	5	5	178,078	45	38,348	17,576	101,843
1927.....	5	5	153,317	48	38,680	18,222	103,536
1928.....	5	5	154,251	45	38,834	18,666	111,198
MICA							
1924.....	50	50	249,876	223	127,201	5,532	357,272
1925.....	36	36	190,144	269	123,079	4,528	261,463
1926.....	22	22	186,478	208	128,269	5,353	229,204
1927.....	21	21	322,389	168	118,505	4,400	174,377
1928.....	16	16	260,074	94	42,159	1,966	87,168
QUARTZ							
1924.....	11	11	991,863	171	172,397	34,281	323,156
1925.....	14	15	1,005,159	153	145,494	20,495	363,612
1926.....	17	18	1,056,705	243	208,839	44,311	553,161
1927.....	19	20	963,216	267	271,555	34,423	496,364
1928.....	17	18	1,159,085	258	222,672	35,948	523,933
SALT							
1924.....	11	12	2,479,563	364	431,618	342,118	1,374,780
1925.....	12	13	2,563,508	402	467,487	315,368	1,410,697
1926.....	11	12	2,782,728	384	482,651	324,612	1,480,149
1927.....	10	11	3,194,802	376	499,967	287,260	1,614,667
1928.....	9	10	4,422,922	455	539,775	252,468	1,495,971
TALC AND SOAPSTONE							
1924.....	6	6	695,786	61	59,220	18,351	154,480
1925.....	7	7	744,037	92	74,519	22,218	205,835
1926.....	6	6	681,434	92	74,634	25,023	217,195
1927.....	8	9	715,439	122	87,721	25,169	236,105
1928.....	5	5	732,608	91	85,161	21,850	219,358

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1924-1928—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries
			\$		\$	\$	\$
OTHER NON-METAL MINING INDUSTRIES—Concluded							
MISCELLANEOUS							
1924.....	33	34	2,428,619	136	82,937	14,948	240,718
1925.....	28	28	2,080,481	218	149,655	58,437	273,327
1926.....	28	28	2,400,850	193	201,468	79,877	386,892
1927.....	32	32	3,315,380	304	313,338	85,302	670,950
1928.....	33	33	4,478,481	394	414,650	128,029	1,002,399
TOTAL OTHER NON-METAL MINING INDUSTRIES							
1924.....	179	182	56,437,570	5,250	5,342,064	1,407,838	12,025,985
1925.....	168	178	51,166,682	5,210	5,307,633	1,581,274	14,506,140
1926.....	165	167	60,960,411	5,910	6,300,437	1,785,572	16,496,211
1927.....	169	170	63,793,776	6,054	6,661,802	1,720,027	17,559,730
1928.....	157	153	55,633,970	6,052	6,745,927	1,904,798	18,826,692
Total Non-Metal Mining Industries Including Fuels							
1924.....	935	5,206	259,360,944	33,831	41,933,916	5,788,085	68,639,068
1925.....	959	5,810	253,023,646	31,560	40,032,918	5,685,294	69,131,057
1926.....	967	5,701	274,109,129	36,166	44,379,854	6,535,609	81,652,421
1927.....	922	5,633	279,737,591	37,949	48,273,491	5,402,897	85,205,431
1928.....	862	5,416	295,725,531	39,086	54,089,011	5,824,098	89,312,961
Clay Products and Other Structural Materials							
BRICK AND TILE							
1924.....	187	192	24,423,104	3,332	3,071,379	1,508,573	7,046,355
1925.....	168	173	22,410,450	3,403	3,167,926	1,565,341	7,374,551
1926.....	178	184	23,034,976	3,644	3,468,052	1,761,516	8,146,514
1927.....	167	176	24,795,253	3,977	3,828,106	1,786,684	8,995,741
1928.....	160	169	26,083,741	4,388	4,153,970	1,985,363	9,853,720
CLAY SEWER PIPE							
1924.....	5	5	3,149,838	467	596,598	281,448	1,343,197
1925.....	5	5	2,810,782	382	461,527	240,038	1,182,454
1926.....	5	5	3,026,076	407	497,512	227,456	1,177,247
1927.....	5	5	3,246,183	421	506,730	214,088	1,137,284
1928.....	5	5	3,746,491	415	511,977	217,003	1,268,020
FIRE BRICK AND OTHER CLAY PRODUCTS							
1925.....	7	7	1,850,385	208	258,416	74,431	584,838
1926.....	6	6	2,114,738	220	274,919	88,552	702,707
1927.....	5	5	1,780,967	188	249,471	75,544	706,984
1928.....	5	5	2,009,449	199	263,910	71,789	715,608
1929.....	5	5	2,241,716	221	333,628	76,055	891,266
STONEWARE AND POTTERY							
1924.....	6	6	387,667	113	114,925	14,642	240,687
1925.....	4	4	424,894	131	129,703	15,660	269,979
1926.....	4	4	310,043	149	130,254	15,538	322,726
1927.....	5	5	359,918	152	50,965	12,956	311,085
1928.....	4	4	401,255	161	175,087	15,929	359,562
TOTAL CLAY PRODUCTS*							
1924.....	205	210	29,810,994	4,120	4,041,318	1,879,094	9,215,077
1925.....	183	188	27,760,864	4,136	4,034,075	1,909,591	9,629,691
1926.....	194	200	28,152,062	4,395	4,346,687	2,080,054	10,357,323
1927.....	185	194	30,437,607	4,776	4,769,307	2,088,724	11,173,189
1928.....	177	186	32,473,203	6,195	5,181,398	2,294,550	12,381,718

*Includes kaolin and other clays.

Table 12.—Principal Statistics of the Mineral Industry in Canada by Industries, 1924-1928—Concluded

Year	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER STRUCTURAL MATERIALS</i>							
<i>CEMENT</i>							
1924.....	6	10	36,766,574	1,837	2,531,622	2,872,711	13,398,411
1925.....	7	11	38,081,583	1,926	2,511,400	2,848,904	14,046,704
1926.....	7	12	41,380,000	2,340	3,052,662	3,424,156	13,013,283
1927.....	6	12	40,509,319	2,270	3,143,932	3,546,000	14,391,937
1928.....	5	11	47,678,841	2,407	3,405,385	3,872,108	16,739,163
<i>LIME</i>							
1924.....	44	49	5,165,964	927	970,672	740,878	3,178,541
1925.....	56	62	5,154,046	1,006	960,434	762,814	3,387,652
1926.....	54	60	5,825,809	1,106	1,082,854	788,990	3,781,484
1927.....	53	60	6,200,481	1,132	1,133,708	826,436	3,923,388
1928.....	46	54	6,952,079	1,218	1,316,115	912,395	4,534,568
<i>SAND AND GRAVEL</i>							
1924.....	558	558	5,194,037	927	848,741	134,378	3,181,083
1925.....	622	622	5,286,268	1,650	1,231,856	158,645	3,220,410
1926.....	580	1,634	6,274,090	5,672	1,557,232	151,236	4,941,434
1927.....	483	2,503	7,668,812	7,133	2,043,962	188,327	6,055,601
1928.....	493	2,553	7,783,135	7,831	2,468,468	193,391	5,809,431
<i>STONE</i>							
1924.....	170	170	14,317,148	2,877	2,768,256	383,800	6,407,757
1925.....	201	201	12,233,773	4,148	3,599,653	479,489	7,464,777
1926.....	229	234	12,760,078	4,510	3,763,726	514,374	7,865,874
1927.....	222	258	13,810,984	5,071	4,571,605	496,503	9,265,304
1928.....	254	268	16,027,547	5,129	4,806,514	579,086	10,272,301
<i>TOTAL OTHER STRUCTURAL MATERIALS</i>							
1924.....	778	787	61,443,723	6,568	7,119,291	4,131,767	26,165,792
1925.....	886	896	60,755,670	8,730	8,303,343	4,249,852	28,119,543
1926.....	870	1,940	66,239,977	13,628	9,466,474	4,878,756	29,602,076
1927.....	764	2,333	68,189,596	16,006	10,893,207	5,057,266	33,636,230
1928.....	798	2,886	78,441,602	16,686	11,996,482	5,566,930	37,555,463
<i>Total Clay Products and Other Structural Materials</i>							
1924.....	983	997	91,254,717	10,688	11,160,609	6,010,861	35,380,869
1925.....	1,069	1,084	88,516,534	12,866	12,337,418	6,159,443	37,649,234
1926.....	1,064	2,140	94,392,039	18,023	13,803,161	6,958,810	39,959,398
1927.....	949	3,027	98,627,203	20,382	15,662,514	7,145,990	44,809,419
1928.....	975	3,072	110,914,805	21,780	17,177,880	7,851,330	49,737,181
<i>GRAND TOTAL OF ALL INDUSTRIES</i>							
1924.....	2,214	7,840	632,443,946	64,328	82,787,421	19,587,452	190,845,547
1925.....	2,351	8,553	632,075,145	65,090	85,103,118	20,565,800	212,531,129
1926.....	2,427	9,345	688,759,008	77,931	94,216,813	23,518,304	237,550,938
1927.....	2,350	9,177	714,073,000	84,674	104,220,892	22,960,284	251,077,661
1928.....	2,345	9,036	841,967,982	89,448	115,954,022	23,432,001	279,826,914

(a) Includes value of pig iron made from Canadian ore deducting the net value of ores treated in 1924.

(b) Production of peat for 1925 and 1928 included in the miscellaneous non-metallics.

Table 13.—Principal Statistics of the Mineral Industry in Canada by Provinces, 1924-1928

Year	Number of active operators	Number of operating plants or mines	Capital employed	Number of employees	Salaries and wages	Cost of fuel and electricity	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries
			\$		\$	\$	\$
*Nova Scotia							
1924.....	72	103	59,608,296	14,172	14,247,382	2,772,595	21,996,864
1925.....	67	95	59,456,860	9,905	12,488,285	2,229,275	16,412,311
1926.....	72	95	60,312,087	13,993	16,109,519	2,941,725	26,702,119
1927.....	78	107	70,934,465	15,663	18,076,122	2,283,744	27,966,861
1928.....	76	104	67,329,525	15,497	21,249,053	2,391,558	28,410,600
NEW BRUNSWICK							
1924.....	39	85	3,362,851	1,190	1,104,918	120,950	1,959,030
1925.....	36	85	3,070,322	1,113	1,003,169	114,629	1,734,613
1926.....	42	91	3,533,577	1,127	952,696	143,264	1,794,836
1927.....	41	79	3,014,614	1,196	1,092,891	125,847	2,106,635
1928.....	42	97	3,331,338	1,244	1,107,462	147,154	2,153,943
QUEBEC							
1924.....	240	242	77,163,613	6,953	7,300,935	2,800,763	18,921,782
1925.....	294	301	83,449,054	8,700	8,566,616	3,152,395	23,817,182
1926.....	331	1,399	112,460,615	15,555	11,912,344	4,662,165	31,629,450
1927.....	381	2,428	110,769,954	18,012	15,104,472	4,988,922	39,617,797
1928.....	402	2,418	133,350,529	17,934	15,921,744	5,953,108	48,631,311
ONTARIO							
1924.....	1,120	5,255	261,071,390	19,265	24,624,854	8,679,474	75,216,531
1925.....	1,209	5,898	258,967,755	19,346	25,909,951	8,463,276	86,641,647
1926.....	1,142	5,753	278,657,190	20,060	26,987,635	8,668,666	84,710,014
1927.....	1,014	5,692	282,205,248	21,147	28,753,161	8,642,617	88,824,642
1928.....	1,022	5,390	325,844,956	23,508	31,912,123	8,343,144	99,003,578
MANITOBA							
1924.....	24	25	7,973,261	541	612,891	268,250	1,534,193
1925.....	25	26	4,948,621	699	711,735	315,005	2,275,772
1926.....	31	32	10,636,439	780	911,424	442,998	3,069,571
1927.....	32	33	11,780,120	1,007	1,232,805	590,225	2,888,895
1928.....	40	41	15,755,174	1,625	1,926,264	631,430	4,183,342
SASKATCHEWAN							
1924.....	81	81	4,157,426	678	669,000	65,641	1,107,498
1925.....	68	68	3,732,909	652	647,014	91,025	1,055,139
1926.....	73	74	5,119,845	742	708,612	111,661	1,175,139
1927.....	72	72	5,089,410	1,112	855,704	110,961	1,432,739
1928.....	77	124	5,647,417	1,229	942,150	140,577	1,686,136
ALBERTA							
1924.....	387	446	87,003,765	8,716	13,684,225	991,549	21,750,278
1925.....	390	465	86,735,632	10,486	13,808,354	1,226,903	24,695,870
1926.....	425	473	102,875,177	10,733	14,499,210	1,380,996	26,351,728
1927.....	376	461	105,203,514	11,205	15,699,304	1,154,548	28,621,537
1928.....	362	490	118,556,978	12,358	18,022,037	1,386,358	31,569,442
BRITISH COLUMBIA							
1924.....	159	194	107,611,494	12,422	19,876,613	3,770,384	47,573,696
1925.....	161	193	107,257,567	13,727	21,440,904	4,801,665	54,160,830
1926.....	226	272	108,594,954	14,566	21,556,415	4,913,255	60,367,481
1927.....	282	329	114,129,277	15,031	22,714,957	4,966,446	58,019,829
1928.....	271	319	159,445,533	15,720	24,064,962	4,312,507	61,847,246
YUKON							
1924.....	92	1,409	24,491,850	391	666,603	117,846	785,675
1925.....	101	1,422	24,456,425	462	527,090	171,627	1,737,765
1926.....	85	1,156	6,560,124	375	578,958	254,474	1,750,600
1927.....	74	76	10,946,398	301	691,476	96,974	1,598,726
1928.....	53	53	12,706,532	333	808,227	126,165	2,335,316
CANADA							
1924.....	2,214	7,840	632,443,946	64,328	82,787,421	19,587,452	190,845,547
1925.....	2,351	8,553	632,075,145	65,090	85,103,118	20,565,900	212,531,129
1926.....	2,427	9,345	688,750,008	77,931	94,216,813	23,513,304	237,550,838
1927.....	2,350	9,177	714,073,000	84,674	104,220,892	23,960,284	251,077,661
1928.....	2,345	9,036	841,967,982	89,448	115,954,022	23,432,001	279,820,914

*Includes a small production from Prince Edward Island.

Table 14.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1928

(a) Eastern Canada and Total for Canada

Industry	Nova Scotia	New Brunswick	Quebec	Ontario	Total for Eastern Canada	Total for Canada
METAL MINING—						
Number of firms.....	10	1	145	100	256	508
Capital employed..... \$	1,863,656		56,935,324	235,045,567	293,844,547	435,327,646
Number of salaried employees—						
Male.....	14		414	823	1,251	2,044
Female.....			51	66	117	180
Number of wage-earners.....	132		3,839	13,453	17,439	26,358
Total employees.....	146		4,304	14,342	18,807	28,582
Salaries..... \$	24,167		810,567	2,488,902	3,323,636	5,211,267
Wages..... \$	112,762		4,706,659	19,955,273	24,785,694	39,475,864
Total..... \$	136,929		5,517,226	22,444,175	28,109,330	44,687,131
Fuel and electricity purchased..... \$	18,712		1,771,976	4,444,116	6,236,004	9,756,573
Net value of products shipped..... \$	26,712		19,720,909	71,097,737	90,845,358	140,770,772
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	19	13		273	305	725
Capital employed..... \$	57,247,450	1,916,304		38,883,830	98,047,584	240,091,561
Number of salaried employees—						
Male.....	483	29		332	844	1,892
Female.....	41	5		114	160	251
Number of wage-earners.....	13,333	599		973	14,905	30,891
Total employees.....	13,857	633		1,419	15,909	33,034
Salaries..... \$	1,055,313	66,805		585,134	1,707,252	4,363,977
Wages..... \$	18,885,377	576,022		1,023,308	20,484,707	42,979,107
Total..... \$	19,940,690	642,827		1,608,442	22,191,959	47,343,084
Fuel and electricity purchased..... \$	2,106,319	45,305		52,510	2,204,134	3,919,300
Net value of products shipped..... \$	25,313,764	1,169,863		4,614,209	31,097,836	70,486,269
<i>Other Non-Metal Mining—</i>						
Number of firms.....	15	5	49	46	115	137
Capital employed..... \$	5,973,779	954,164	38,572,315	7,690,307	53,190,565	55,633,970
Number of salaried employees—						
Male.....	35	14	167	70	286	312
Female.....	7	4	24	21	56	66
Number of wage-earners.....	890	285	3,452	804	5,431	5,674
Total employees.....	932	303	3,643	895	5,773	6,052
Salaries..... \$	87,729	56,883	439,096	164,758	748,466	831,164
Wages..... \$	702,756	165,081	3,983,722	766,862	5,618,421	5,914,763
Total..... \$	790,485	221,964	4,422,818	931,620	6,366,887	6,745,927
Fuel and electricity purchased..... \$	131,285	45,500	1,291,305	345,787	1,811,937	1,904,798
Net value of products shipped..... \$	2,072,793	583,940	12,060,447	2,853,353	17,570,533	18,826,692
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms.....	32	23	208	603	866	975
Capital employed.....	2,244,640	460,870	37,842,890	44,225,252	84,773,652	110,914,805
Number of salaried employees—						
Male.....	16	21	260	364	661	833
Female.....	2	3	22	69	96	111
Number of wage-earners.....	544	209	9,705	6,419	16,937	20,856
Total employees.....	562	293	9,987	6,852	17,694	21,780
Salaries..... \$	42,030	59,656	530,600	927,014	1,559,300	1,975,187
Wages..... \$	338,949	172,015	5,451,100	6,000,872	11,962,906	15,202,693
Total..... \$	380,949	231,671	5,981,700	6,927,886	13,522,206	17,177,880
Cost of fuel and electricity..... \$	135,242	55,089	2,889,827	3,502,731	6,582,889	7,851,350
Net value of products shipped..... \$	997,331	400,140	16,949,955	20,438,279	38,685,705	49,737,181
ALL INDUSTRIES						
Number of firms.....	76	42	402	1,022	1,542	2,345
Capital employed..... \$	67,329,525	3,331,338	133,350,529	325,844,956	529,856,348	841,967,982
Number of salaried employees—						
Male.....	548	64	841	1,589	3,042	5,081
Female.....	50	12	97	270	429	608
Number of wage-earners.....	14,899	1,168	16,996	21,649	54,712	83,759
Total employees.....	15,497	1,244	17,934	23,508	58,183	89,448
Salaries..... \$	1,209,239	183,344	1,780,263	4,165,805	7,338,654	12,351,595
Wages..... \$	20,039,814	924,118	14,141,451	27,746,315	62,851,728	103,572,427
Total..... \$	21,249,053	1,107,462	15,921,744	31,912,123	70,190,382	115,954,022
Cost of fuel and electricity..... \$	2,391,558	147,154	5,953,108	8,343,144	16,834,964	23,432,001
Net value of products shipped..... \$	28,410,600	2,153,943	48,631,311	99,003,578	178,199,432	279,820,914

* Includes data covering the operations of one antimony mine.

Table 14.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1928—Concluded

(b) Western Canada

Industry	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Total for Western Canada
METAL MINING—						
Number of firms.....	9			191	52	252
Capital employed..... \$	8,261,635			120,717,932	12,503,532	141,483,099
Number of salaried employees—						
Male.....	45			727	21	793
Female.....	7			53	3	63
Number of wage-earners.....	387			8,227	305	8,919
Total employees.....	439			9,007	329	9,775
Salaries..... \$	100,005			1,717,585	70,041	1,887,631
Wages..... \$	682,919			13,270,345	736,906	14,690,170
Total..... \$	782,924			14,987,930	806,947	16,577,801
Cost of fuel and electricity..... \$	132,261			3,262,168	126,140	3,520,569
Net value of products shipped..... \$	407,146			47,185,842	2,332,426	49,925,414
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	3	61	337	18	1	420
Capital employed..... \$		4,230,302	110,178,805	27,430,870	203,000	142,043,977
Number of salaried employees—						
Male.....		30	761	257		1,048
Female.....		4	70	17		91
Number of wage-earners.....		536	10,403	5,043	4	15,986
Total employees.....		570	11,234	5,317	4	17,125
Salaries..... \$		69,874	1,925,581	661,270		2,656,725
Wages..... \$		509,685	15,054,552	6,928,883	1,280	22,494,400
Total..... \$		579,559	16,980,133	7,590,153	1,280	25,151,125
Cost of fuel and electricity..... \$		46,007	977,231	691,903	25	1,715,166
Net value of products shipped..... \$		798,166	28,090,488	10,496,889	2,890	39,388,433
<i>Other Non-Metal Mining—</i>						
Number of firms.....	2	5	2	13		22
Capital employed..... \$		304,000		909,779		2,443,405
Number of salaried employees—						
Male.....		2		10		26
Female.....				2		10
Number of wage-earners.....		27		138		243
Total employees.....		29		150		279
Salaries..... \$		7,000		23,562		82,698
Wages..... \$		39,637		147,495		296,342
Total..... \$		46,637		171,057		379,040
Cost of fuel and electricity..... \$		32,038		22,971		92,861
Net value of products shipped..... \$		78,599		567,787		1,256,159
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms.....	26	11	23	49		109
Capital employed..... \$	6,353,667	1,113,115	8,287,419	10,386,952		26,141,153
Number of salaried employees—						
Male.....	48	17	47	60		172
Female.....	3		4	8		15
Number of wage-earners.....	1,058	613	1,050	1,178		3,899
Total employees.....	1,109	630	1,101	1,246		4,086
Salaries..... \$	109,005	35,834	105,901	165,147		415,887
Wages..... \$	886,299	280,120	922,693	1,150,675		3,239,787
Total..... \$	995,304	315,954	1,028,594	1,315,822		3,655,674
Cost of fuel and electricity..... \$	461,317	62,532	409,127	355,465		1,288,441
Net value of products shipped..... \$	3,166,797	809,371	3,478,580	3,596,728		11,051,476
ALL INDUSTRIES						
Number of firms.....	40	77	362	271	53	803
Capital employed..... \$	15,755,174	5,647,417	118,556,978	159,445,533	12,706,532	312,111,634
Number of salaried employees—						
Male.....	104	49	811	1,054	21	2,039
Female.....	17	4	75	80	3	179
Number of wage-earners.....	1,504	1,176	11,472	14,586	309	29,047
Total employees.....	1,625	1,229	12,358	15,720	333	31,265
Salaries..... \$	255,696	112,708	2,036,932	2,567,564	70,041	5,042,941
Wages..... \$	1,670,568	829,442	15,985,105	21,497,398	738,136	40,720,699
Total..... \$	1,926,264	942,150	18,022,037	24,064,962	808,227	45,763,640
Cost of fuel and electricity..... \$	631,430	140,577	1,386,358	4,312,507	126,165	6,597,037
Net value of products shipped..... \$	4,183,342	1,686,136	31,569,442	61,847,246	2,335,316	101,621,482

Table 15.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927					\$	\$	\$
Nova Scotia.....	538	43	15,082	15,663	1,161,902	16,914,220	18,076,122
New Brunswick.....	72	8	1,116	1,196	162,603	930,288	1,092,891
Quebec.....	820	70	17,122	18,012	1,584,212	13,520,260	15,104,472
Ontario.....	1,478	224	19,445	21,147	3,724,221	25,028,940	28,753,161
Manitoba.....	77	5	925	1,007	199,316	1,033,489	1,232,805
Saskatchewan.....	53	3	1,056	1,112	106,337	749,367	855,704
Alberta.....	726	80	10,399	11,205	1,785,184	13,914,120	15,699,304
British Columbia.....	872	63	14,096	15,031	2,277,246	20,437,711	22,714,957
Yukon.....	17	3	281	301	65,481	625,995	691,476
Canada.....	4,653	499	79,522	84,674	11,066,502	93,154,390	104,220,892
1928							
Nova Scotia.....	548	50	14,899	15,497	1,209,239	20,039,814	21,249,053
New Brunswick.....	64	12	1,168	1,244	183,344	924,118	1,107,462
Quebec.....	841	97	16,996	17,934	1,780,263	14,141,481	15,921,744
Ontario.....	1,589	270	21,649	23,508	4,165,808	27,746,315	31,912,123
Manitoba.....	104	17	1,504	1,625	255,696	1,670,568	1,926,264
Saskatchewan.....	49	4	1,176	1,229	112,708	829,442	942,150
Alberta.....	811	75	11,472	12,358	2,036,932	15,985,105	18,022,037
British Columbia.....	1,054	80	14,586	15,720	2,567,564	21,497,398	24,064,962
Yukon.....	21	3	309	333	70,041	738,186	808,227
Canada.....	5,081	608	83,759	89,448	12,381,595	103,572,427	115,954,022

*Note on the Method of Computing the Average Number of Wage-earners for Each Industry.—If a company works only 3 months in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 3. If a second company operates every month in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 12. The average number of wage-earners for each other company in the industry is computed in the same way. The average number of wage-earners in the industry during the year is the sum of these individual averages.

Table 16.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1926 and 1927

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927					\$	\$	\$
METAL MINING							
Alluvial Gold.....	16	3	302	321	44,195	428,401	472,596
Auiferous Quartz.....	456	31	7,535	8,022	1,417,203	11,518,516	12,935,719
Copper-gold-silver.....	325	15	3,743	4,063	612,303	4,647,792	5,260,095
Silver-Cobalt.....	105	4	1,349	1,458	285,498	1,892,665	2,178,163
Silver-Lead-Zinc.....	222	7	2,877	3,106	468,827	4,338,990	4,807,817
Nickel copper.....	27	.....	1,590	1,617	85,048	2,401,265	2,486,313
Miscellaneous.....	5	.....	60	65	2,960	20,984	23,944
Non-Ferrous Smelting and Refining.....	584	60	7,027	7,671	1,551,036	10,569,204	12,120,240
NON-METAL MINING INCLUDING FUELS							
Fuels							
Coal.....	1,328	87	28,357	29,772	3,148,677	35,807,290	38,955,967
Natural Gas.....	369	115	858	1,342	665,047	870,451	1,535,498
Petroleum.....	87	23	671	781	172,759	947,465	1,120,224

* See note above.

Table 16.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1927 and 1928—Concluded

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927					\$	\$	\$
<i>Other Non-Metal Mining</i>							
Abrasives.....	10		122	132	21,200	86,403	107,603
Asbestos.....	129	12	2,835	2,976	349,434	3,411,758	3,761,192
Feldspar.....	7		227	234	11,643	139,910	151,553
Gypsum.....	53	10	1,364	1,427	178,976	1,132,712	1,311,688
Iron oxides.....	3		45	48	3,750	34,930	38,680
Mica.....	6	3	159	168	14,622	103,883	118,505
Quartz.....	16	1	250	267	21,940	249,615	271,555
Salt.....	40	14	322	376	121,100	378,867	499,967
Talc and Soapstone.....	11	2	109	122	15,198	72,523	87,721
Miscellaneous.....	27	4	273	304	45,910	267,428	313,338
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	113	12	2,145	2,270	270,328	2,873,604	3,143,932
Clay products.....	313	47	4,416	4,776	744,367	4,024,940	4,769,307
Lime.....	83	14	1,035	1,132	168,195	965,513	1,133,708
Sand and Gravel.....	107	12	7,014	7,133	226,423	1,817,539	2,043,962
Stone.....	211	23	4,837	5,071	419,863	4,151,742	4,571,605
Total.....	4,653	499	79,522	84,674	11,066,592	93,154,390	104,229,892
1928							
<i>METAL MINING</i>							
Alluvial Gold.....	22	3	317	342	50,836	487,434	538,270
Auriferous Quartz.....	565	43	8,458	9,066	1,637,362	12,978,628	14,615,990
Copper-Gold-Silver.....	424	37	4,316	4,777	844,646	5,919,663	6,764,309
Silver-Cobalt.....	90	4	1,072	1,166	246,284	1,563,182	1,809,466
Silver-Lead-Zinc.....	284	18	3,378	3,680	646,460	4,885,174	5,531,634
Nickel-Copper.....	43	1	1,919	1,963	142,249	2,994,589	3,136,838
Miscellaneous.....	4	1	57	62	7,850	54,036	61,886
Non-Ferrous Smelting and Refining.....	612	73	6,841	7,526	1,635,580	10,593,158	12,228,738
<i>NON-METAL MINING INCLUDING FUELS</i>							
<i>Fuels</i>							
Coal.....	1,404	98	28,754	30,256	3,388,458	39,932,353	43,320,811
Natural Gas.....	409	137	1,114	1,660	818,919	1,286,729	2,105,648
Petroleum.....	79	16	1,023	1,118	156,600	1,760,025	1,916,625
<i>Other Non-Metal Mining</i>							
Abrasives.....	10	1	152	163	20,710	75,848	96,558
Asbestos.....	128	19	3,023	3,170	372,070	3,617,574	3,989,644
Feldspar.....	7	1	215	223	14,172	130,488	144,660
Gypsum.....	57	18	1,084	1,159	180,870	990,944	1,171,814
Iron Oxides.....	3		42	45	4,074	34,760	38,834
Mica.....	4	2	88	94	6,480	35,679	42,159
Quartz.....	15	2	241	258	24,884	197,788	222,672
Salt.....	45	16	394	455	117,376	422,399	539,775
Talc and Soapstone.....	7	2	82	91	17,410	67,751	85,161
Miscellaneous.....	36	5	353	394	73,118	341,532	414,650
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	113	9	2,285	2,407	256,867	3,148,518	3,405,385
Clay Products.....	321	48	4,826	5,195	806,209	4,375,189	5,181,398
Lime.....	84	16	1,118	1,218	184,732	1,131,383	1,316,115
Sand and Gravel.....	83	12	7,736	7,831	199,745	2,268,723	2,468,468
Stone.....	232	26	4,871	5,129	527,634	4,278,880	4,806,514
Total.....	5,081	608	83,759	89,448	12,381,595	103,572,427	115,954,022

* See note page 31.

Table 17.—Wage-Earners in the Mineral Industry in Canada, by Months and by Classes, 1927 and 1928

Month	Metal Mining	Non-Metal Mining including Fuels			Clay Products and other Structural Materials			Total
		Fuels	Other Non-Metal-lics	Total	Clay Products	Other structural materials	Total	
1927								
January.....	22,153	31,636	4,457	36,093	2,376	4,946	7,322	65,568
February.....	22,076	31,055	4,383	35,438	2,251	5,494	7,745	65,259
March.....	22,138	29,231	4,674	33,905	2,754	6,289	9,043	65,086
April.....	22,432	27,431	5,156	32,587	3,400	7,406	10,806	65,825
May.....	22,645	26,698	5,977	32,675	4,421	9,493	13,914	69,234
June.....	23,476	27,444	6,132	33,576	4,808	14,701	19,509	76,561
July.....	23,325	27,970	5,852	33,822	4,920	15,292	20,212	77,359
August.....	23,777	29,047	5,903	34,950	4,765	11,323	16,088	74,815
September.....	24,000	29,962	5,836	35,798	4,443	10,917	15,360	75,158
October.....	24,012	31,312	5,655	36,977	4,075	9,442	13,517	74,496
November.....	23,493	32,625	5,292	37,917	3,664	7,858	11,522	72,932
December.....	22,692	33,141	4,994	38,135	2,990	6,290	9,280	70,107
*Average.....	24,483	29,886	5,706	35,592	4,416	15,031	19,447	79,522
1928								
January.....	22,378	32,880	4,435	37,315	2,421	4,967	7,388	67,081
February.....	22,857	31,328	4,323	35,651	2,370	5,171	7,541	66,049
March.....	23,550	30,213	4,419	34,632	2,912	5,959	8,871	67,053
April.....	23,748	28,675	4,740	33,415	3,503	7,319	10,822	67,985
May.....	24,906	28,463	5,360	33,823	4,665	10,002	14,667	73,396
June.....	25,524	29,049	5,637	34,686	4,980	15,383	20,363	80,573
July.....	25,663	29,486	5,691	35,177	5,129	15,480	20,609	81,449
August.....	25,862	30,166	5,813	35,979	5,136	11,245	16,381	78,222
September.....	26,177	30,782	5,910	36,692	4,700	10,502	15,202	78,071
October.....	26,474	32,584	5,927	38,511	4,362	10,073	14,435	79,420
November.....	25,737	32,741	5,724	38,465	4,008	9,251	13,259	77,461
December.....	24,745	32,666	5,372	38,038	3,348	7,249	10,597	73,380
*Average.....	26,358	30,891	5,674	36,565	4,826	16,010	20,836	83,759

* See note page 31.

Table 18.—Wage-Earners in the Mineral Industry in Canada, by Months and by Provinces, 1927 and 1928

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Canada
1927										
January.....	14,436	844	9,018	15,478	374	752	11,586	12,938	142	65,568
February.....	14,340	857	9,083	15,797	418	683	10,982	12,956	143	65,259
March.....	14,273	933	9,530	16,337	433	576	9,510	13,347	147	65,086
April.....	14,614	940	9,919	17,381	567	473	8,187	13,606	138	65,825
May.....	14,786	1,097	11,528	18,431	792	699	8,088	13,628	185	69,234
June.....	15,195	1,149	16,679	19,456	987	757	8,415	13,685	258	76,561
July.....	15,134	1,136	16,945	19,547	1,042	717	9,029	13,508	301	77,359
August.....	14,962	1,130	13,451	19,721	989	632	10,039	13,576	315	74,815
September.....	14,958	1,001	13,601	19,623	873	658	10,394	13,766	284	75,158
October.....	14,970	1,086	12,424	19,382	769	896	10,934	13,769	266	74,496
November.....	14,715	970	11,304	18,533	645	969	12,122	13,453	221	72,932
December.....	14,525	896	10,659	17,006	647	806	12,714	12,716	138	70,107
*Average.....	15,082	1,116	17,122	19,445	925	1,056	10,399	14,096	281	79,522
1928										
January.....	14,216	817	8,592	16,485	718	776	12,566	12,726	185	67,081
February.....	14,089	803	8,578	16,786	741	648	11,359	12,860	185	66,049
March.....	14,195	853	9,491	17,507	835	614	10,343	13,036	179	67,053
April.....	14,635	885	9,952	18,724	925	496	9,100	12,965	303	67,985
May.....	15,116	1,110	11,614	20,628	1,333	695	8,775	13,759	366	73,396
June.....	15,171	1,141	16,734	21,429	1,453	730	9,356	14,220	339	80,573
July.....	15,051	1,162	16,821	21,667	1,502	625	9,936	14,351	334	81,449
August.....	14,872	1,078	13,115	21,581	1,460	630	10,844	14,287	355	78,222
September.....	14,347	1,071	12,832	21,451	1,305	784	11,448	14,439	394	78,071
October.....	14,332	1,341	12,587	21,429	1,161	1,033	12,412	14,759	366	79,420
November.....	14,524	1,056	12,224	20,131	1,100	1,074	12,932	14,113	307	77,461
December.....	14,404	997	10,783	18,683	927	810	13,000	13,520	256	73,380
*Average.....	14,899	1,168	16,996	21,649	1,504	1,176	11,472	14,586	309	83,759

* See note page 31.

Table 19.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1927 and 1928

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 hours
1927				
By Provinces—				
Nova Scotia.....	13,738	1,711	539	83
New Brunswick.....	172	888	241	27
Quebec.....	2,077	2,395	14,126	610
Ontario.....	12,285	4,176	5,562	543
Manitoba.....	124	190	805	156
Saskatchewan.....	115	75	1,119	25
Alberta.....	11,884	463	935	445
British Columbia.....	15,274	291	30	3
Yukon.....	169	.....	165	14
Canada.....	55,838	10,189	23,522	1,906
By Industries—				
METAL MINING—				
Alluvial Gold.....	194	12	177	15
Auriferous Quartz.....	7,239	953	94	61
Copper-Gold-Silver.....	3,179	1,242	98	75
Silver-Cobalt.....	1,326	256	5	14
Silver-Lead-Zinc.....	3,158	79	284	56
Nickel-Copper.....	1,240	425	12	1
Miscellaneous.....	.....	61	.....	.....
Non-Ferrous Smelting and Refining.....	5,622	526	1,454	40
NON-METAL MINING INCLUDING FUELS—				
Fuels—				
Coal.....	30,437	813	1,117	51
Natural Gas.....	345	771	33	9
Petroleum.....	164	239	191	281
Other Non-Metal Mining—				
Abrasives.....	14	30	167	6
Asbestos.....	21	.....	3,117	70
Feldspar.....	3	174	125	.....
Gypsum.....	92	1,353	344	83
Iron Oxides.....	.....	.....	40	16
Mica.....	58	68	54	.....
Quartz.....	88	55	179	.....
Salt.....	68	201	78	10
Talc and Soapstone.....	.....	58	55	4
Miscellaneous.....	.....	.....	.....	.....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	683	489	1,013	489
Clay Products.....	1,076	1,043	3,100	154
Lime.....	224	293	627	143
Sand and Gravel.....	97	418	5,998	218
Stone.....	510	630	5,160	110
Total.....	55,838	10,189	23,522	1,906
1928				
By Provinces—				
Nova Scotia.....	4,541	1,083	776	68
New Brunswick.....	247	781	196	10
Quebec.....	2,638	2,465	12,824	779
Ontario.....	12,915	5,677	4,257	843
Manitoba.....	375	186	978	76
Saskatchewan.....	85	17	900	27
Alberta.....	12,770	657	640	178
British Columbia.....	15,907	71	18	14
Yukon.....	218	3	191	15
Canada.....	49,696	10,950	20,780	2,010
By Industries—				
METAL MINING—				
Alluvial Gold.....	249	7	203	29
Auriferous Quartz.....	7,690	1,480	73	85
Copper-Gold-Silver.....	3,697	935	232	37
Silver-Cobalt.....	910	250	6	7
Silver-Lead-Zinc.....	3,696	171	234	29
Nickel-Copper.....	1,827	489	27	9
Miscellaneous.....	25	38	.....	8
Non-Ferrous Smelting and Refining.....	5,877	818	953	78

Table 19.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1927 and 1928—Concluded

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 10 hours
NON-METAL MINING INCLUDING FUELS—				
<i>Fuels—</i>				
Coal.....	21,804	687	1,002	38
Natural Gas.....	345	937	33	8
Petroleum.....	680	249	74	57
<i>Other Non-Metal Mining—</i>				
Abrasives.....	10	28	152	6
Asbestos.....	18	60	3,205	71
Feldspar.....		129	132	
Gypsum.....	88	906	439	69
Iron Oxides.....			32	25
Mica.....	24	17	37	
Quartz.....	43	32	214	
Salt.....	68	222	98	13
Talc and Soapstone.....	12	6	64	
Miscellaneous.....				
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	809	458	878	587
Clay Products.....	846	1,363	3,046	390
Lime.....	247	347	680	108
Sand and Gravel.....	172	94	4,903	221
Stone.....	559	1,227	4,063	135
Total.....	49,696	10,950	20,780	2,010

Table 20.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING						
Alluvial Gold.....	Quantity		5			
	\$		340			
Auriferous Quartz.....	Quantity	3,147	23,441	660		322
	\$	26,134	232,173	11,704		5,161
Copper-Gold-Silver.....	Quantity	3,996	10	75	3,650	80
	\$	42,052	90	1,200	23,206	1,321
Silver-Cobalt.....	Quantity		7,889	854		89
	\$		91,012	14,004		1,127
Silver-Lead-Zinc.....	Quantity	27,888	3,013	57		685
	\$	144,876	26,428	924		5,953
Nickel-Copper.....	Quantity		3,311	3		241
	\$		24,162	48		2,027
Miscellaneous.....	Quantity	64				
	\$	420				
Non-Ferrous Smelting and Refining.....	Quantity	56,575	106,514	133		229,378
	\$	384,909	650,931	2,053		2,166,276
Total.....	Quantity	91,670	144,178	1,787	3,650	230,795
	\$	598,391	1,024,796	30,273	23,206	2,181,865
NON-METAL MINING, INCLUDING FUELS						
<i>Fuels</i>						
Coal.....	Quantity	873,273		156,484		
	\$	3,040,740		111,025		
Natural Gas.....	Quantity		52			
	\$		410			
Petroleum.....	Quantity	3,561		460		
	\$	26,867		4,139		
Total.....	Quantity	876,834	52	156,944		
	\$	3,067,607	410	115,164		
<i>Other Non-Metal Mining</i>						
Asbestos.....	Quantity	21,395	18,683	14,538		1,557
	\$	157,547	137,795	98,755		18,965
Feldspar.....	Quantity		540			
	\$		4,837			
Gypsum.....	Quantity	7,533	4,925			629
	\$	46,748	38,700			5,565
Iron Oxides.....	Quantity	950		12		
	\$	7,140		192		
Mica.....	Quantity		100			
	\$		700			
Quartz.....	Quantity	146	2,848			30
	\$	1,309	18,396			275
Salt.....	Quantity		51,167			
	\$		263,009			
Talc.....	Quantity		354			
	\$		2,302			
Miscellaneous.....	Quantity	2,037	4,203	2		
	\$	12,311	27,003	30		
Natural Abrasives.....	Quantity	886				
	\$	5,940				
Total.....	Quantity	32,947	82,820	14,559		2,216
	\$	230,995	492,742	98,977		24,805

Industry in Canada, by Kinds and by Industries, 1927

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
1,638			992				2,201,850		2,014,730	3,814,720
1,480			6,996				22,018	30,834		58,294
44,595	28,931	1,395,938	13,445	6,902			221,866,174		9,575,633	
17,111	7,008	121,230	58,249	329		126	1,742,860	2,222,085		
68,179	3,769	191,627	11,486				59,889,657		29,691,582	
26,093	1,491	19,273	56,481				424,930	596,137		
6,480	150	84,548	2,041				17,251,738			
1,975	37	12,263	12,271			30,521	309,338	472,548		
64,999	4,912	283,870	6,367				38,988,849		11,295,285	4,539,230
27,016	1,456	76,947	39,225				265,695	588,520		78,782
520	1,554	40,173					37,351,166			
137	896	4,857					89,059	120,656		
			10							
			40					460		
28,925	4,196	5,498,852	5,875	293,038	337		1,112,907,760		262,034,688	
7,653	1,122	426,123	43,787	39,560	299	1,780	2,655,634	6,350,127		
215,336	43,512	7,495,008	40,216	299,940	337		1,490,457,194		314,611,918	8,353,950
81,465	11,510	660,693	217,045	39,889	299	32,427	5,509,534	10,411,397		137,076
6,315	1,861						24,419,359		100,303,703	2,493,785
1,979	526						404,656	3,558,926		58,513
1,620					34,659		5,820			
365					10,090		316	11,181		
4,042		22,980	112		980,267		1,591,250			
1,039		977	460		53,889		25,392	112,763		
11,977	1,861	22,980	112		1,014,926		26,016,429		100,303,703	2,493,785
3,583	526	977	460		63,979		430,364	3,682,870		58,513
	5,000						60,900,833			
	1,050						632,429	1,046,541		
5,603			1,016							
1,505			3,890					10,232		
114,833	1,914	132,039	2,025		4,036		4,074,291		86,314	
28,203	531	12,525	3,760		1,907		60,260	198,199		
1,500		160	1,383				170,306			
458		19	7,007				3,406	18,222		
865	46		461				18,000			
181	10		2,888				621	4,400		
4,316	706	78,478					399,420			
1,222	195	6,177					6,849	34,423		
		15,000	2				1,361,491			
		2,250	8			6,498	15,495	257,260		
1,483			765				1,467,700			
420			2,877				19,570	25,169		
2,177		299,956	2,064	3,533			1,477,284			
618		23,827	6,418	283		528	14,284	85,302		
			662				74,000			
			2,384				1,955	10,279		
180,777	7,688	555,653	8,578	3,653	4,036		69,043,825		86,314	
52,607	1,786	44,798	29,232	283	1,907	7,086	754,869	1,720,627		

Table 20.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement.....Quantity	248,161	250,182	.....	14,528	.....	69
\$	1,350,933	1,385,395	.....	46,487	.....	661
Clay Products.....Quantity	30,019	187,496	1,923	16,257	.....	2,961
\$	203,472	1,176,044	11,857	40,161	.....	22,626
Lime.....Quantity	22,232	45,318	1,307	.....	.....	9,982
\$	157,829	245,078	6,425	.....	.....	71,814
Sand and Gravel.....Quantity	3,318	23,334	.....	891	.....	.....
\$	25,890	134,157	.....	2,673	.....	.....
Stone.....Quantity	6,403	24,064	950	.....	.....	.....
\$	48,281	148,540	7,413	.....	.....	.....
Total.....Quantity	310,133	530,394	4,180	31,676	.....	13,012
\$	1,786,405	3,089,214	25,695	89,321	.....	95,101
Canada.....Quantity	1,311,584	757,444	20,519	192,270	.....	246,623
\$	5,683,398	4,607,162	154,945	227,691	.....	2,301,771

Table 21.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING						
Alluvial Gold.....Quantity	.....	.....	.....	.....	.....	.....
\$
Auriferous Quartz.....Quantity	1,233	25,338	323	.....	.....	192
\$	14,601	259,426	6,085	.....	.....	2,913
Copper-Gold-Silver.....Quantity	6,498	40	.....	15	.....	32
\$	51,679	426	.....	840	.....	659
Silver-Cobalt.....Quantity	.....	7,594	780	.....	.....	.....
\$	.....	89,546	12,300	.....	.....	.....
Silver-Lead-Zinc.....Quantity	27,139	3,563	12	389	.....	624
\$	136,881	32,126	312	3,878	.....	5,183
Nickel-Copper.....Quantity	.....	2,546	38	.....	.....	145
\$	.....	15,891	678	.....	.....	1,520
Miscellaneous.....Quantity	150	.....	.....	.....	.....	.....
\$	1,200	.....	.....	.....	.....	.....
Non-Ferrous Smelting and Refining.....Quantity	70,362	152,230	238	.....	.....	3,929
\$	445,475	982,235	3,064	.....	.....	42,125
Total.....Quantity	105,382	191,311	1,391	404	.....	4,922
\$	649,836	1,379,650	22,439	4,718	.....	52,400
NON-METAL MINING, INCLUDING FUELS						
<i>Fuels</i>						
Coal.....Quantity	859,922	.....	.....	153,746	.....	.....
\$	3,073,544	.....	.....	135,975	.....	.....
Natural Gas.....Quantity	161	72	.....	.....	.....	1
\$	1,197	697	.....	.....	.....	12
Petroleum.....Quantity	2,599	.....	.....	522	.....	.....
\$	22,663	.....	.....	3,174	.....	.....
Total.....Quantity	862,682	72	.....	154,268	.....	1
\$	3,097,404	697	.....	139,149	.....	12

in Canada, by Kinds and by Industries, 1927—Concluded

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
5,592 1,140	1,752 371						180,083,257 761,013	3,546,000	256,300	
26,296 6,237	1,060 231	204,336 22,811	62,951 302,027	1,927 154	408,323 28,591	378	16,063,068 274,135	2,088,724	1,000	
4,552 1,114	150 34		60,058 282,855	174,736 13,979	6,500 3,900	4	1,685,056 43,404	826,436	357,645	
22,365 5,288	3,384 788	8,000 600	205 1,460				1,318,770 17,471	188,327		
114,594 27,353	5,670 1,709	65,518 5,739	4,854 22,883				13,938,544 234,585	496,503	177,260	
173,399 41,137	12,016 3,133	277,854 29,150	128,068 609,225	176,663 14,133	414,823 32,491	382	213,088,695 1,330,608	7,145,990	792,205	
531,489 158,587	65,055 16,955	8,321,475 735,618	176,774 855,966	480,136 54,305	1,434,122 98,676	39,835	1,799,505,643 8,025,375	22,960,284	415,794,140	10,847,735 195,589

Industry in Canada, by Kinds and by Industries, 1928

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. Gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
500 545	95 76	800 640	1,280 8,273				4,764,440 47,644	57,178	3,080,890	6,744,140 67,741
72,891 24,045	15,766 4,656	1,458,077 122,963	26,504 116,472				224,756,744 2,002,062	2,554,657	9,090,375	145,705 2,914
65,479 25,277	26,507 5,522	676,058 72,130	17,744 84,762				66,446,922 490,541	731,836	30,117,509	
3,121 944	90 22	93,485 12,994	1,099 6,252				15,596,388 282,405	430,683		
68,714 31,773	4,553 1,020	431,156 92,265	55,776 30			26,220	47,255,254 310,932	671,564	867,522	
15,049 4,194	1,438 321	65,171 7,218	105 1,500			1,418	38,148,448 91,078	121,005		
200 100	80 20		7,500					8,880		
53,472 15,109	9,180 2,520	7,920,609 579,190	7,867 59,046	30,011 3,717	185 154		1,133,644,412 3,046,772	5,180,770	257,742,837	
279,426 101,987	57,809 14,217	10,645,446 887,400	65,026 338,186	30,011 3,717	185 154	30,435	1,530,612,608 6,271,434	9,756,573	300,899,133	6,889,845 70,655
10,287 3,323	2,441 702						29,598,802 466,177	3,679,721	108,926,689	4,157,361 76,527
29,703 8,750	3,600 1,440	184,124 15,464	1,054				2,197,500 28,382	205,183	88,000	
39,990 12,073	6,041 2,142	184,124 15,464	208 1,376				31,797,045 494,607	3,919,300	109,023,239	4,157,361 76,527

Table 21.—Fuel and Electricity Used in the Mineral Industry

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
<i>Other Non-Metal Mining</i>						
Asbestos.....Quantity	38,893	12,186	14,123			2,357
\$	266,607	94,642	95,224			28,617
Feldspar.....Quantity		764				
\$		6,693				
Gypsum.....Quantity	11,528	5,980	5			590
\$	70,736	44,965	53			4,957
Iron Oxides.....Quantity	1,001		22			
\$	7,197		341			
Mica.....Quantity		60				
\$		420				
Quartz.....Quantity	78	3,590				
\$	557	22,970				
Salt.....Quantity	2,576	47,481				
\$	11,310	213,416				
Talc.....Quantity		394				
\$		2,563				
Miscellaneous.....Quantity	6,123	6,209	2			
\$	37,691	34,519	31			
Natural Abrasives.....Quantity	1,057					
\$	7,534					
<i>Total</i>.....Quantity	61,256	76,664	14,152			2,947
\$	401,632	480,188	95,649			83,574
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement.....Quantity	276,721	282,914		20,358		84
\$	1,473,885	1,551,324		61,126		781
Clay Products.....Quantity	30,870	205,688	4,676	27,058		4,745
\$	211,385	1,284,079	33,557	56,785		33,553
Lime.....Quantity	18,409	57,762	1,642	90		10,940
\$	125,620	285,337	7,333	450		73,143
Sand and Gravel.....Quantity	3,873	22,627		193		
\$	28,614	123,006		647		
Stone.....Quantity	6,908	24,027	575	90		
\$	45,231	163,193	3,257	736		
Total.....Quantity	336,781	593,018	6,893	47,789		15,769
\$	1,884,735	3,412,539	44,197	119,744		107,477
Canada.....Quantity	1,366,101	861,065	22,436	202,461		23,639
\$	6,033,607	5,213,074	162,285	263,611		193,463

*Coke used for fuel only. Coke used in smelting amounted to 187,960 tons valued at \$1,824,061.

in Canada, by Kinds and by Industries, 1928—Concluded

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
14,898	5,222	2,350					62,593,252			
3,278	1,149	306					687,892	1,177,715		
12,462			733							
3,237			2,968					12,898		
158,027		176,065	1,680		3,550		5,060,964		64,000	
35,401		16,100	3,351		1,516		65,181	242,260		
1,600		145	1,592				144,728			
472		17	7,744				2,895	18,666		
1,100			200							
308			1,238					1,966		
2,352	1,016	55,615					630,000			
571	242	3,391					8,217	35,945		
		27,272	2				1,845,790			
		3,548	8			6,472	17,714	252,468		
			60				1,404,700			
			68				19,219	21,850		
1,079	125	277,965	2,409	7,859			2,535,760			
233	81	22,874	9,271	628			22,751	128,029		
2,223			833				74,000			
500			3,009				1,955	12,998		
193,741	6,363	539,412	7,509	7,859	3,550		74,289,194		64,000	
44,000	1,422	46,236	27,657	628	1,516	6,472	825,824	1,904,798		
7,486	803						179,771,381		12,087,200	
1,695	168						783,129	3,872,108		
34,174	2,345	339,815	55,337	629	727,218		15,640,454		1,000	
7,981	512	33,300	306,344	50	36,907		289,297	2,294,350		
1,465	245	385,525	71,561	217,108	13,000		4,864,482		343,658	
338	61	15,746	324,943	17,369	6,500		55,505	912,395		
24,983	2,005	28,710	125				1,522,877			
5,788	492	2,153	900				26,791	193,391		
85,210	4,500	67,706	3,313				17,893,126		1,400,000	
20,065	1,128	5,497	14,493				325,486	579,086		
153,318	9,898	821,756	130,336	217,737	740,218		219,692,320		13,831,858	
35,867	2,361	56,696	646,680	17,419	43,407		1,480,208	7,851,330		
666,475	80,111	12,190,738	203,079	255,607	2,539,964		1,856,391,170		423,818,230	11,047,206
193,927	20,142	1,005,796	1,013,899	21,764	201,453	36,907	9,072,073	23,432,001		147,182

Table 22.—Fuel and Electricity Used in the Mineral

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia.....Quantity	540,198					3,438
\$	2,001,974					16,392
New Brunswick.....Quantity	13,529					
\$	68,199					
Quebec.....Quantity	218,859	145,808	15,481			4,237
\$	1,260,009	1,000,144	107,129			47,311
Ontario.....Quantity		603,392	4,355			148,529
\$		3,534,639	42,451			1,311,425
Manitoba.....Quantity	32,699	8,244	140			
\$	250,417	72,379	840			
Saskatchewan.....Quantity	4,902			35,111		
\$	38,783			46,058		
Alberta.....Quantity	153,483			153,509		
\$	560,914			158,427		
British Columbia.....Quantity	347,895		543	3,650		89,814
\$	1,501,189		4,525	23,206		926,569
Yukon.....Quantity	19					5
\$	1,913					74
Canada.....Quantity	1,311,534	757,444	20,519	192,270		246,023
\$	5,633,398	4,607,162	154,945	227,691		2,301,771

Table 23.—Fuel and Electricity Used in the Mineral

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia.....Quantity	530,871		5			4,111
\$	2,069,222		53			20,456
New Brunswick.....Quantity	17,480	4	1			1
\$	91,458	80	9			12
Quebec.....Quantity	282,196	151,521	17,028	90		6,570
\$	1,637,153	1,064,044	117,317	736		72,640
Ontario.....Quantity	1,626	674,424	4,572			12,136
\$	12,457	3,874,977	37,780			93,235
Manitoba.....Quantity	211	35,015	290	15		2
\$	2,467	272,991	2,882	840		36
Saskatchewan.....Quantity	6,069			55,864		
\$	52,397			63,924		
Alberta.....Quantity	168,552			146,103		49
\$	613,854			194,233		172
British Columbia.....Quantity	359,091	101	540	389		770
\$	1,554,574	982	4,244	3,878		6,912
Yukon.....Quantity	5					
\$	25					
Canada.....Quantity	1,366,101	861,065	22,436	202,461		23,639
\$	6,033,607	5,213,074	162,285	263,611		193,463

Industry in Canada, by Provinces, 1927

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
142,961 37,259	2,049 565	128,344 18,292	4,951 21,384	180,196 14,416		816	5,732,708 172,646		63,276,380	1,130,849 16,926
602 193	100 24	100 10	10,396 50,212		12,904 3,066		174,310 4,143		1,319,500	
135,217 41,390	13,582 3,758	145,932 14,174	30,418 156,790			4	808,158,560 2,358,213		239,608,396	
137,546 34,065	38,962 9,390	3,396,389 325,149	68,429 354,884	6,902 329	48,656 26,022	37,159	467,352,053 2,967,104		1,068,728	
24,168 11,123	450 293	7,760 4,345	29,803 151,984				15,190,222 98,844		2,059,000	
1,680 487		293,151 23,472	154 937				37,674 1,224		638,000	
11,201 3,266	1,861 526	22,848 944	1,625 7,663		1,372,562 69,588		32,219,019 353,220		11,042,349	328,897 18,026
68,055 22,606	7,551 1,981	4,216,509 294,885	30,520 102,106	293,038 39,560			468,439,247 2,047,963		93,874,502	5,573,269 102,343
10,059 8,198	500 418	110,442 54,347	468 10,006				2,201,850 22,018		2,907,285	3,814,720 58,294
531,489 158,587	65,055 16,955	8,321,475 735,618	176,774 855,966	480,136 54,305	1,434,122 98,676	39,835	1,799,505,643 8,025,375		415,794,140	10,847,735 195,589

Industry in Canada, by Provinces, 1928

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
160,816 36,568	90 24	157,546 23,411	5,963 25,088	225,596 18,047			7,951,307 198,689		77,226,074	1,660,657 22,607
850 229	100 24		10,545 45,879		12,313 3,045		262,080 6,418		1,154,000	
141,560 40,774	37,177 7,986	368,429 35,802	44,794 221,463				801,098,212 2,755,193		232,267,916	
152,223 36,566	26,730 6,999	5,985,971 500,445	80,331 418,929		95,466 53,462	32,866	469,852,186 3,275,428		8,926,858	145,705 2,914
34,287 15,424	1,675 606	101,600 42,512	29,458 170,520				13,640,020 123,152			
4,535 1,279		272,613 22,421	2 24				8,950 532		1,000	
36,855 11,209	6,041 2,142	184,124 15,464	2,495 11,054		2,432,185 144,946		38,806,503 393,284		17,873,454	1,142,637 26,838
120,156 38,333	8,298 2,361	5,019,033 316,027	28,701 105,705	30,011 3,717			520,007,472 2,271,773		82,420,516	1,354,067 27,082
15,193 13,545		101,422 49,714	790 15,237				4,764,440 47,644		3,948,412	6,744,140 67,741
666,475 193,927	80,111 20,142	12,190,738 1,005,796	203,079 1,013,899	255,607 21,764	2,539,964 201,453	36,907	1,556,391,170 9,072,073		423,818,230	11,047,206 147,182

Table 24.—Power Employed in the Mineral Industry in Canada, by Provinces, 1928, with Comparative Totals for 1927

Province	Steam engines and turbines	Internal combustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
Nova Scotia.....No.	115	55	6	176	194	370	356	550	173
H.P.	56,668	2,677	1,215	60,560	5,214	65,774	31,558	36,772	44,024
New Brunswick....No.	46	37	.....	83	22	105	26	48	43
H.P.	2,494	457	.....	2,951	469	3,420	478	947	2,483
Quebec.....No.	87	57	15	159	2,488	2,647	91	2,579	138
H.P.	4,379	1,142	51,795	57,316	107,426	164,742	2,430	109,866	8,695
Ontario.....No.	243	255	18	516	3,691	4,207	191	3,882	305
H.P.	17,621	8,530	8,070	34,221	184,459	218,680	9,935	194,394	32,463
Manitoba.....No.	15	6	4	25	206	231	.....	206	24
H.P.	410	164	420	994	9,273	10,267	.....	9,273	1,262
Saskatchewan.....No.	46	6	.....	52	6	58	25	31	31
H.P.	2,797	241	.....	3,038	45	3,083	490	535	3,222
Alberta.....No.	315	96	.....	411	644	1,055	379	1,023	294
H.P.	38,852	1,971	.....	40,823	25,488	66,311	10,761	36,249	34,079
British Columbia..No.	171	103	99	373	2,123	2,496	885	3,008	162
H.P.	39,236	6,574	43,817	89,627	121,664	211,291	41,297	162,961	27,192
Yukon.....No.	1	4	3	8	18	26	20	38	3
H.P.	100	370	500	970	2,165	3,135	213	2,378	165
Canada, 1928.....No.	1,039	619	145	1,803	9,392	11,195	1,973	11,365	1,173
H.P.	162,557	22,126	105,817	290,500	456,203	746,703	97,162	553,365	153,590
Canada, 1927.....No.	1,002	559	103	1,669	8,200	9,869	1,825	10,025	1,136
H.P.	149,140	19,696	97,298	266,134	381,261	647,395	84,489	465,750	145,694

Table 25.—Power Employed in the Mineral Industry in Canada by Industries, 1928, with Comparative Totals for 1927

Industry	Steam engines and turbines	Internal combustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
METAL MINING—									
Alluvial Gold.... No.	2	6	9	17	19	36	19	3	
H.P.	40	93	563	696	2,170	2,866	2,170	58	
Auriferous Quartz. No.	34	53	23	110	1,265	1,375	1,420	104	
H.P.	1,804	6,434	8,201	16,439	65,575	82,014	6,262	71,837	9,142
Copper-Gold-Silver No.	8	21	22	51	336	387	98	434	34
H.P.	1,373	728	10,630	12,731	19,629	32,360	4,868	24,497	1,853
Silver-Cobalt.... No.	3			3	156	159		166	13
H.P.	235			235	6,133	6,368		6,133	980
Silver-Lead-Zinc. No.	28	54	32	114	488	602	37	525	28
H.P.	7,699	3,444	3,149	14,292	18,379	32,671	694	19,073	4,088
Nickel-Copper.... No.		2		2		238		236	1
H.P.		157		157	20,718	20,875		20,718	25
Miscellaneous.... No.									4
H.P.									165
Non-Ferrous Smelting and Refining.... No.	22	5	21	48	2,812	2,860	521	3,333	38
H.P.	12,790	115	64,535	77,440	144,444	221,884	19,506	163,950	12,222
Total..... No.	97	141	107	345	5,312	5,657	811	6,123	225
H.P.	23,941	10,971	87,078	121,990	277,048	399,038	31,330	308,378	28,533
NON-METAL MINING INCLUDING FUELS—									
<i>Fuels</i>									
Coal..... No.	488	56	2	546	688	1,234	861	1,549	473
H.P.	110,389	336	12,000	122,775	23,645	146,420	53,170	76,315	85,016
Natural Gas.... No.	9	138		147	6	153	15	21	10
H.P.	465	2,467		2,932	33	2,965	218	251	580
Petroleum..... No.	53	60		113	72	185	13	85	83
H.P.	2,421	1,525		3,946	731	4,677	257	988	5,151
Total..... No.	550	254	2	806	766	1,572	889	1,655	566
H.P.	113,275	4,378	12,000	129,653	24,409	154,062	53,645	78,054	90,747
<i>Other Non-Metal Mining</i>									
Abrasives..... No.	11	1		12	6	18		6	11
H.P.	390	5		395	241	636		241	490
Asbestos..... No.	5	1		6	575	581		575	7
H.P.	1,120	6		1,126	35,369	36,495		35,369	515
Feldspar..... No.	9	5		14		14			10
H.P.	197	119		316		316			283
Gypsum..... No.	17	51		68	119	187	19	138	13
H.P.	1,526	2,005		3,531	4,771	8,302	420	5,191	1,155
Iron Oxides..... No.		2		2	4	6		4	1
H.P.		60		60	117	177		117	15
Mica..... No.			1	1	2	3		2	7
H.P.			145	145	75	220		75	380
Quartz..... No.	10	7		17	11	28	3	14	6
H.P.	407	314		721	582	1,303	40	622	675
Salt..... No.	25	3		28	73	101	3	76	31
H.P.	642	350		992	928	1,920	46	974	6,480
Talc and Soap-stone. No.					18	18		18	1
H.P.					695	695		695	80
Miscellaneous.... No.	8	8	3	19	51	70	9	60	9
H.P.	435	247	500	1,182	1,520	2,702	262	1,732	495
Total..... No.	85	78	4	167	859	1,026	34	893	96
H.P.	4,717	3,106	645	8,468	44,298	52,766	768	45,066	10,568
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—									
Cement..... No.	3	9	10	22	1,125	1,147	157	1,282	15
H.P.	2,151	290	4,400	6,841	66,768	73,609	8,640	75,408	3,427
Clay Products.... No.	91	38		129	416	545	10	426	107
H.P.	7,719	1,150		8,869	16,531	25,400	234	16,765	9,176
Lime..... No.	9	5	1	15	181	196	28	209	33
H.P.	448	92	20	560	3,866	4,426	615	4,481	1,815
Sand and Gravel. No.	66	30	10	106	83	189	6	89	32
H.P.	3,518	644	589	4,751	2,300	7,051	220	2,520	3,927
Stone..... No.	138	64	11	213	650	863	38	638	99
H.P.	6,788	1,495	1,085	9,368	20,983	30,351	1,710	22,655	5,397
Total..... No.	307	146	32	485	2,455	2,940	239	2,694	286
H.P.	20,624	3,671	6,094	30,389	110,448	140,837	11,419	121,867	23,742
Grand total 1928.... No.	1,039	619	145	1,803	9,392	11,195	1,973	11,365	1,173
H.P.	162,557	22,126	105,817	299,500	456,263	746,793	97,162	553,365	153,590
Grand total 1927.... No.	1,002	559	108	1,669	8,200	9,869	1,825	10,025	1,136
H.P.	149,140	19,696	97,298	266,134	381,261	647,395	84,489	465,750	145,694

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1927 and 1928

Classification	1927		1928	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—				
Iron ore..... tons	1,487,366	2,875,624	2,222,897	4,325,159
Pigs, Ingots, Blooms and Billets—				
Pig iron..... tons	45,833	781,832	48,504	791,733
Ferro-silicon and ferro-manganese..... cwt.	78,847	375,133	127,606	485,740
Billets, not less than 60 lb. per lineal yard..... cwt.	335,510	454,431	521,959	812,585
Other pigs, ingots, blooms and billets..... cwt.	73,547	278,333	427,000	886,851
Total pigs, ingots, blooms and billets..... \$		1,889,729		2,976,909
Scrap, wrought..... tons	96,463	1,172,726	146,389	1,610,030
Scrap, other..... tons	5,665	61,464	6,584	65,445
Castings and Forgings—				
Axles, parts and blanks..... \$		2,069,499		1,516,504
Locomotive and car wheel tires..... cwt.	236,912	1,059,423	201,719	898,920
Other castings and forgings..... \$		1,350,920		3,385,236
Total castings and forgings..... \$		4,479,842		5,800,660
Rolling Mill Products—				
Band and hoop..... cwt.	1,342,999	4,576,149	1,304,492	4,457,155
Bars and Rails—				
Railway rails..... tons	27,926	830,365	31,181	974,866
Other bars and rails..... cwt.	2,429,042	6,555,929	3,435,030	8,944,679
Plates and Sheets—				
Boiler plate..... cwt.	171,855	378,861	229,345	541,404
Canada plates..... cwt.	246,439	960,206	207,696	773,325
Tinned plates..... cwt.	1,429,063	7,504,436	1,483,875	7,432,065
Plates not less than 30 in. by $\frac{1}{2}$ in., n.o.p..... cwt.	1,147,451	2,203,760	1,461,437	2,773,984
Sheets, No. 14 gauge and thinner, n.o.p..... cwt.	1,178,924	4,157,274	1,514,277	5,141,842
Galvanized, flat..... cwt.	454,289	1,862,804	640,999	2,424,437
Galvanized, other..... cwt.	2,699	10,480	4,380	15,967
Skelp, for pipe, etc..... cwt.	2,201,915	4,228,894	3,265,785	6,034,132
Other plates and sheets..... cwt.	734,099	1,694,781	1,388,469	3,197,806
Rods..... cwt.	886,060	1,202,064	1,044,375	1,543,172
Flat eye-bar blanks..... tons		1,433		4,213
Bridges..... \$	37	85,831	109	136,744
Other structural iron..... cwt.	4,086,297	7,959,076	5,403,700	10,438,621
Total rolling mill products..... \$		44,112,343		54,834,512
Tubes, Pipes and Fittings—				
Boiler tubes..... \$		929,311		1,073,174
Cast iron pipe..... cwt.	116,950	233,746	125,880	218,377
Seamless tubing, not less 3 $\frac{1}{2}$ c. per lb..... cwt.	67,290	421,411	78,002	532,846
Other tubes, pipes, etc..... \$		2,142,898		2,503,062
Total tubes, pipes and fittings..... \$		3,727,361		4,327,459
Wire—				
Barbed fencing..... cwt.	127,644	403,937	102,994	326,428
Galvanized, No. 9, 12 and 13 gauge, not telegraph or telephone..... cwt.	250,405	660,720	219,366	574,315
Steel wire for rope..... cwt.	103,874	657,453	146,506	901,275
Wire rope, twisted wire, clothes lines, wire cable, etc., n.o.p..... \$		354,348		346,081
Other..... \$		1,258,093		1,484,717
Total wire..... \$		3,334,551		3,632,816
Chains..... \$		902,195		863,196
Engines and Boilers—				
Engines, automobile..... No.	107,941	12,345,198	117,007	11,503,741
Engines, internal combustion, other..... No.	13,383	1,851,558	16,719	2,497,101
Locomotives and parts..... No.	77	466,946	189	1,136,644
Other boilers, engines, etc..... \$		2,256,597		3,268,795
Total engines and boilers..... \$		16,920,299		18,406,281
Farm Implements and Machinery—				
Cream separators..... No.	18,618	698,418	20,575	878,006
Other dairy machinery..... \$		126,131		222,174
Harvesters..... No.	5,562	1,293,388	7,573	2,008,141
Other harvesting implements and machinery..... \$		494,417		535,845
Planting and Tillage—				
Drills and parts..... No.	6,480	882,479	6,256	839,587
Ploughs and parts..... \$		1,634,123		2,037,884
Other planting..... \$		682,385		1,034,852

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1927 and 1928—Continued

Classification	1927		1928	
	Quantity	Value \$	Quantity	Value \$
IRON AND ITS PRODUCTS—Concluded				
Farm Implements and Machinery—Concluded				
Seed Separation—				
Threshing machine separators.....	No. 4,467	4,044,503	7,760	8,214,938
Threshing machine separator parts.....	\$	721,952		1,134,128
Fanning mills.....	No. 2,292	67,230	2,717	73,502
Traction engines for farm purposes—				
Not over \$1,400 each.....	No. 15,663	12,094,706	21,131	18,640,776
Other.....	No. 231	491,728	316	645,516
Farm tractor parts and repairs.....	\$	1,326,129		1,842,396
Other farm implements.....	\$	1,543,749		1,755,745
Total farm implements and machinery.....	\$	26,101,338		39,893,490
Hardware and Cutlery—				
Cutlery.....	\$	1,581,321		1,742,346
Hardware—				
Nails, wire.....	cwt. 21,172	72,174	14,506	48,035
Other nails, spikes, tacks.....	\$	33,824		39,770
Needles and pins.....	\$	444,607		456,788
Nuts and bolts.....	cwt. 34,857	361,052	46,322	508,683
Screws.....	\$	144,987		151,888
Other hardware.....	\$	1,376,725		1,622,477
Total hardware and cutlery.....	\$	4,014,690		4,569,987
Machinery (Except Agricultural)—				
Sewing machines.....	No. 18,923	566,356	25,821	762,859
Sewing machine parts and attachments.....	\$	336,518		478,666
Washing machines, domestic.....	No. 17,949	1,222,623	23,427	1,561,547
Other household machinery.....	\$	197,478		216,166
Rock drills.....	No. 863	443,692	509	616,169
Other mining and metallurgical.....	\$	3,182,482		4,084,346
Office or Business—				
Adding.....	No. 5,956	820,658	10,781	1,227,285
Typewriting.....	No. 15,674	877,586	19,021	1,027,847
Other.....	\$	665,200		690,171
Printing and Book-Binding—				
Printing presses.....	\$	2,265,330		3,098,798
Typesetting machines.....	\$	911,136		1,091,786
Other printing and bookbinding.....	\$	746,496		1,035,876
Coke and gas machinery.....	\$	312,946		691,970
Cranes and derricks.....	No. 266	974,676	337	1,385,011
Logging equipment.....	\$	1,166,359		1,410,883
Metal-working, n.o.p.....	\$	2,901,215		4,438,952
Paper and pulp mill.....	\$	3,770,179		2,399,212
Pumps, power, and parts.....	No. 8,074	962,375	8,817	1,095,037
Rolling mill machines.....	\$	325,310		255,151
Shovels, steam, electric or other power.....	No. 100	811,234	165	1,495,828
Textile.....	\$	5,077,355		4,690,356
Other machinery.....	\$	17,700,550		23,388,535
Total machinery (except agricultural).....	\$	46,237,754		57,142,451
Springs.....	\$	182,264		238,060
Stamped and Coated Products—				
Tin cans.....	\$	673,173		518,047
Other.....	\$	1,334,083		1,842,751
Tools and hand implements.....	\$	2,489,459		2,971,011
Vehicles—				
Automobiles, freight.....	No. 3,804	4,638,207	7,182	8,305,235
Automobiles, passenger.....	No. 32,826	26,904,209	40,226	32,527,641
Automobile parts.....	\$	31,852,100		48,839,955
Railway cars, all kinds.....	No. 969	365,575	1,247	960,332
Railway cars, parts of.....	\$	830,081		965,590
Other vehicles of iron.....	\$	907,549		1,870,486
Total vehicles.....	\$	65,497,721		93,469,239
Drums, tanks, cylinders.....	\$	1,173,137		1,380,998
Furniture.....	\$	836,326		1,175,627
Plates for agricultural implements.....	cwt. 61,191	305,667	37,174	179,092
Pumps, hand.....	No. 34,508	443,492	54,058	552,348
Stoves.....	\$	628,022		886,611
Valves.....	\$	787,104		849,764
Articles for shipbuilding.....	\$	1,321,942		1,480,077
Other iron and steel.....	\$	16,649,248		18,967,124
Total iron and its products.....	\$	248,151,554		322,959,144

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1927 and 1928—Continued

Classification	1927		1928		
	Quantity	Value \$	Quantity	Value \$	
Non-Ferrous Metals—					
Alumina and bauxite.....	cwt.	2,532,353	6,036,019	3,275,154	4,336,782
Cryolite.....	cwt.	24,483	164,437	69,265	297,629
Aluminium ingots, sheets.....	lb.	1,114,511	331,335	1,396,210	415,809
Other aluminium.....	\$		1,363,420		1,674,908
Brass—					
Scrap.....	cwt.	29,085	270,627	33,957	356,000
Bars and rods.....	cwt.	6,523	114,270	7,802	143,934
Strips, sheets, plates.....	cwt.	7,847	158,742	14,095	262,767
Tubing.....	lb.	2,765,078	627,124	3,322,210	748,869
Wire, plain.....	lb.	453,239	113,668	393,204	98,658
Wire cloth.....	\$		48,030		53,463
Other.....	\$		3,674,838		4,476,247
Total brass.....	\$		5,007,299		6,139,938
Copper—					
Blocks, pigs, ingots.....	lb.	3,795,607	510,771	7,883,600	1,176,941
Scrap.....	cwt.	58,171	737,029	56,063	785,141
Bars and rods.....	cwt.	271,161	3,847,404	366,027	5,639,888
Strips, sheets, plates.....	cwt.	18,367	385,477	25,867	521,559
Tubing.....	lb.	2,124,343	506,745	2,549,901	602,730
Other.....	\$		1,288,144		2,005,099
Total copper.....	\$		7,275,570		10,731,358
Lead—					
Pigs, bars and sheets.....	lb.	490,653	40,759	577,920	36,646
Other.....	\$		361,271		365,664
Nickel—					
Bars, rods, sheets, etc.....	lb.	825,715	233,366	730,106	240,378
Nickel-plated ware.....	\$		2,194,808		2,536,559
Other.....	\$		907,693		571,660
Precious Metals—					
Electro-plated ware.....	\$		1,013,799		1,282,513
Silver in bars, blocks, etc.....	\$		896,535		984,547
Other.....	\$		708,061		751,391
Tin—					
Blocks, bars, pigs.....	cwt.	48,338	3,066,082	53,587	2,822,413
Foil.....	lb.	154,622	77,914	102,388	61,127
Other (collapsible tubes).....	\$		82,179		44,655
Zinc—					
Spelter.....	lb.	1,355,816	89,233	1,845,258	107,920
Sheets and plates.....	lb.	5,909,244	512,099	9,295,469	686,899
Other.....	\$		311,636		214,371
Phosphor tin and bronze.....	lb.	686,388	253,893	772,565	299,578
Other alloys, n.o.p.....	\$		54,268		47,145
Clocks and watches.....	\$		3,257,037		3,541,150
Electric Apparatus—					
Batteries, storage.....	No.	28,168	593,443	33,278	598,754
Dynamos, generators.....	\$		1,270,925		1,441,735
Incandescent lamps—					
Carbon filament.....	No.	2,058,104	106,125	1,239,055	64,594
Metal filament.....	No.	3,251,645	266,065	1,770,970	138,244
Electric light fixtures.....	\$		793,910		1,008,992
Meters.....	\$		367,800		396,900
Motors.....	\$		2,790,957		3,826,192
Spark plugs, etc.....	\$		761,285		875,831
Switches, etc.....	\$		1,404,610		1,571,622
Telegraph instruments.....	\$		237,996		388,717
Telephone instruments.....	\$		873,453		1,488,427
Wireless apparatus.....	\$		3,256,660		5,090,239
Other.....	\$		5,875,722		7,015,179
Total electric apparatus.....	\$		18,598,951		23,905,429
Gas apparatus.....	\$		219,066		253,081
Printing materials (except machinery)—					
Stereotypes.....	sq. in.	6,168,984	272,025	6,313,103	320,332
Other.....	\$		107,000		130,942
Manganese oxide.....	cwt.	1,397,802	1,451,370	2,128,861	1,058,821
Ores, n.o.p.....	cwt.	777,769	695,248	751,177	826,278
Antimony, not ground.....	lb.	1,284,483	143,446	1,529,823	140,958
Mercury.....	lb.	124,099	160,330	199,603	269,746
Lamps, sidelights, etc.....	\$		1,107,807		1,389,745
Other non-ferrous metals.....	\$		2,201,700		2,453,007
Total non-ferrous metals.....	\$		59,195,656		68,939,379

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1927 and 1928—Continued

Classification		1927		1928	
		Quantity	Value	Quantity	Value
			\$		\$
Non-Metallic Minerals—					
Asbestos other than crude.....	\$		671,882		835,887
Clay and Clay Products—					
China clay.....	cwt.	420,822	235,824	462,357	262,207
Fireclay.....	cwt.	984,526	219,500	1,219,155	266,320
Other clays.....	\$		94,989		96,907
Bricks, building.....	M	6,672	142,438	14,513	246,723
Bricks, fire.....	\$		1,794,490		1,829,380
Brick and tile, n.o.p.....	\$		681,593		886,796
Pottery and chinaware.....	\$		5,043,993		4,782,242
Artificial teeth.....	\$		388,092		445,609
Bath tubs, etc.....	\$		501,338		573,604
Other.....	\$		535,959		633,959
Total clay and clay products.....	\$		9,638,216		10,023,747
Coal and Coal Products—					
Coal, anthracite.....	tons	4,107,854	31,282,371	3,748,816	27,680,018
Coal, bituminous.....	tons	14,065,142	29,439,815	12,761,484	25,385,242
Coal for ships' stores.....	tons	503,529	1,018,069	684,461	1,229,185
Coal tar, crude.....	gal.	3,812,637	286,307	6,003,182	438,244
Carbolic oil.....	gal.	1,336,312	276,518	1,803,659	346,423
Coke.....	tons	772,235	4,742,224	1,060,029	6,102,842
Lignite and coal products, n.o.p.....	\$		82,465		69,436
Total coal and coal products.....	\$		67,127,769		61,251,395
Glass and Glassware—					
Carboys, bottles, jars, etc. (including milk bottles). ..	\$		1,409,644		1,509,584
Tableware.....	\$		879,331		1,041,826
Incandescent lamp bulbs and tubing for.....	\$		529,162		563,147
Common window glass.....	sq. ft.	41,752,878	1,127,529	45,509,833	1,179,052
Plate glass—					
Not over 7 sq. ft.....	sq. ft.	3,779,673	1,321,243	4,743,644	1,343,920
7 to 25 sq. ft.....	sq. ft.	666,861	272,275	944,562	336,891
Other, not bevelled.....	sq. ft.	1,033,289	462,317	1,338,273	530,101
Other glass and glassware.....	\$		2,145,197		2,789,574
Total glass and glassware.....	\$		8,146,698		9,294,095
Graphite and products.....					
	\$		123,137		128,026
Petroleum, Asphalt and Their Products—					
Asphalt, solid.....	cwt.	954,733	856,225	959,811	822,425
Other asphalt and oil.....	\$		109,552		142,452
Crude Petroleum—					
Natural, for refining.....	gal.	684,269,831	31,043,180	853,889,703	35,237,350
Other, for refining.....	gal.	45,500	4,226	263,771	26,378
Other, -8235 and heavier.....	gal.	81,343,133	3,524,132	62,680,093	2,452,504
Fuel oil for ships' stores.....	gal.	37,870,909	1,543,316	32,539,383	981,622
Coal and kerosene oil, refined.....	gal.	4,028,966	349,371	3,964,692	354,927
Gasoline—					
Under .725 specific gravity.....	gal.	85,432,311	8,794,848	116,062,590	13,526,618
Other.....	gal.	22,736,017	2,623,846	27,590,526	3,285,800
Lubricating oil.....	gal.	12,537,957	3,744,563	15,487,945	4,502,463
Other oils.....	\$		214,666		239,503
Other petroleum products.....	\$		1,036,569		1,062,824
Total petroleum, asphalt and their products.....	\$		53,844,494		62,634,866
Stone and Its Products—					
Abrasives.....	\$		3,219,847		4,129,225
Building and paving stone.....	\$		499,523		672,245
Cement.....	cwt.	67,739	87,541	119,166	146,164
Silica sand.....	cwt.	2,976,622	346,138	3,087,676	332,338
Whiting.....	cwt.	318,186	190,634	342,034	200,760
Marble, slate and other.....	\$		1,844,456		2,356,480
Total stone and its products.....	\$		6,188,139		7,837,212
Miscellaneous—					
Carbons, electric.....	\$		1,051,810		480,334
Diamonds, unset.....	\$		2,754,151		3,402,993
Insulators, electric.....	\$		278,763		429,529
Salt.....	cwt.	3,535,208	1,082,080	3,780,510	1,122,968
Sulphur.....	cwt.	3,553,725	2,918,047	3,646,860	2,962,935
Other non-metallic minerals.....	\$		1,579,480		1,768,440
Total non-metallic minerals.....	\$		155,404,666		162,172,427

Table 26.—Principal Imports into Canada of Mineral Products during Calendar Years 1927 and 1928—Concluded

Classification	1927		1928	
	Quantity	Value	Quantity	Value
		\$		\$
CHEMICALS AND ALLIED PRODUCTS—				
Acid, citric.....	lb. 219,254	72,205	351,385	152,930
Acid, stearic.....	lb. 1,581,578	150,754	1,536,832	168,370
Other acids.....	\$ 478,248			683,718
Alcohols, industrial.....	gal. 5,245	15,785	9,479	20,809
Cellulose products.....	\$ 2,502,768			2,519,085
Drugs and medicinal preparations.....	\$ 2,907,266			3,715,028
Dyeing and Tanning Materials—				
Aniline and coal tar dyes.....	lb. 2,932,189	1,693,158	3,080,740	1,775,977
Coal tar dye products, n.o.p.....	lb. 451,563	101,454	571,487	117,932
Logwood, oak, quebracho extracts.....	lb. 41,533,303	1,659,931	44,198,159	1,725,895
Other dyeing and tanning articles.....	\$ 431,620			473,777
Total dyeing and tanning materials.....	\$ 3,886,163			4,093,581
Explosives.....				
	\$ 563,897			606,713
Fertilizers, n.o.p.—				
Potash, muriate of.....	cwt. 373,469	627,997	477,101	842,988
Soda nitrate.....	cwt. 533,668	1,252,730	535,606	1,204,017
Superphosphates.....	cwt. 1,731,777	979,261	1,949,789	1,188,537
Other.....	\$ 1,278,065			1,784,299
Total fertilizers, n.o.p.....	\$ 4,138,053			5,019,841
Paints, Pigments and Varnishes—				
Litharge.....	cwt. 30,150	245,630	39,773	279,136
Lead, red.....	lb. 1,844,288	125,358	1,469,943	100,733
Black, carbon.....	lb. 9,599,189	637,954	12,940,270	853,230
Blacks, other.....	lb. 1,841,591	135,352	1,815,546	132,543
Lithopone.....	lb. 15,804,451	644,175	16,287,182	117,207
Oxide of cobalt, etc.....	lb. 237,787	147,236	266,749	133,818
Oxides, fireproofs.....	lb. 6,711,100	632,470	6,969,104	709,539
Zinc white.....	lb. 16,665,713	1,113,573	18,128,357	1,166,491
Liquid fillers, etc.....	lb. 3,353,232	519,837	1,159,370	579,877
Varnish, lacquers, etc.....	gal. 103,967	201,739	137,727	246,120
Other paints, etc.....	\$ 561,144			630,787
Total paints, pigments and varnishes.....	\$ 4,964,468			5,549,481
Perfumery, Cosmetics—				
Perfumes over 4 oz.....	gal. 2,718	97,702	2,914	124,023
Other.....	\$ 1,194,110			1,278,816
Soap—				
Castile.....	lb. 1,176,528	96,772	1,221,382	98,322
Common laundry.....	lb. 9,875,487	718,906	9,320,902	697,584
Other.....	\$ 373,362			371,004
Inorganic Chemicals, n.o.p.—				
Alum in bulk.....	cwt. 23,892	36,650	40,310	57,332
Sulphate of alumina.....	cwt. 416,490	473,366	441,244	521,903
Ammonia, nitrate of.....	lb. 5,525,794	247,069	3,873,554	147,024
Sal ammoniac.....	lb. 3,535,977	148,890	3,615,678	143,701
Copper sulphate.....	lb. 4,697,121	228,249	5,369,045	274,645
Chlorine, liquid.....	lb. 9,047,961	290,919	5,327,349	186,734
Chloride of lime.....	lb. 16,082,908	254,222	12,782,907	202,674
Potash compounds.....	lb. 5,683,993	559,057	4,459,110	465,353
Soda compounds.....	lb. 224,837,965	3,192,925	272,405,089	3,465,965
Acid phosphate.....	lb. 3,113,540	228,433	3,263,291	245,518
Other.....	\$ 825,106			1,086,542
Total inorganic chemicals, n.o.p.....	\$ 6,484,886			6,798,291
Other Drugs, Dyes and Chemicals—				
Glycerine.....	lb. 2,129,761	448,437	5,702,244	597,982
Other chemicals and allied products.....	\$ 4,219,718			4,468,116
Total chemicals and allied products.....	\$ 33,313,500			36,963,694

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1927 and 1928

Classification	1927		1928		
	Quantity	Value	Quantity	Value	
		\$		\$	
IRON AND ITS PRODUCTS—					
Ore, including chromite.....	tons	2,475	12,125	2,615	12,500
Pigs, Ingots, Blooms and Billets—					
Pig Iron.....	tons	385	7,752	1,168	20,642
Ferro-manganese and ferro-silicon.....	tons	43,821	2,833,946	43,830	3,071,567
Billets, ingots and blooms.....	tons	1,138	26,658	1,304	30,949
Total pigs, ingots, blooms and billets.....	\$		2,868,356		3,123,158
Scrap iron.....	tons	77,876	782,407	86,687	954,363
Castings.....	\$		147,893		84,905
Forgings.....	\$		32,816		4,483
Rolling Mill Products—					
Bars and rods.....	tons	16,527	657,890	25,917	870,390
Plates and sheets.....	tons	197	12,624	216	13,625
Rails.....	tons	28,160	963,383	6,632	220,093
Structural steel.....	tons	3,269	295,252	278	31,305
Total rolling mill products.....	\$		1,929,139		1,135,413
Pipe and Tubing.....	\$		1,943,081		1,845,010
Wire—					
Barbed.....	cwt.	24,909	84,628	30,701	103,182
Woven fencing.....	\$		183,293		118,129
Other.....	\$		585,837		699,850
Engines and Boilers—					
Locomotives and parts.....	No.	2	49,623	2	77,667
Other.....	\$		155,375		177,456
Farm Implements and Machinery—					
Cream separators.....	\$		72,802		44,709
*Milking machines and parts.....	No.				231,997
Harvesters.....	No.	15,528	2,586,978	9,756	1,705,509
Hay rakes.....	No.	1,838	65,625	2,628	88,778
Mowers.....	No.	24,777	1,427,523	10,950	658,296
Reapers.....	No.	681	65,457	1,882	172,471
*Reaper threshers.....	No.			1,721	1,610,975
Cultivators.....	No.	14,161	900,185	15,921	932,240
Drills.....	No.	6,806	1,105,809	5,687	949,846
Harrows.....	\$		309,560		450,574
Ploughs.....	\$		2,175,628		2,739,923
Threshing machines.....	\$		4,338,378		472,304
Spades and shovels.....	\$		251,714		321,561
Other.....	\$		504,849		691,260
Parts.....	\$		2,682,395		3,385,285
Total farm implements and machinery.....	\$		16,486,903		14,455,728
Hardware and Cutlery—					
Razors and razor blades.....	\$		1,834,168		904,782
Nails, wire.....	cwt.	66,858	238,453	75,266	260,540
Nails, other.....	cwt.	17,656	131,082	18,414	133,690
Needles and pins.....	\$		353,769		567,286
Bolts and nuts.....	cwt.	10,653	65,003	9,611	63,900
Other hardware.....	\$		285,002		259,896
Machinery—					
Electric vacuum cleaners.....	No.	35,209	1,440,477	39,462	1,660,809
Sewing machines.....	\$		3,074,148		4,468,956
Adding machines.....	No.	2,125	201,366	3,839	397,689
Typewriters.....	No.	598	27,612	1,067	48,075
Metal-working.....	\$		64,743		263,120
Wood-working.....	\$		38,173		21,262
Other machinery.....	\$		745,004		712,018
Total machinery.....	\$		5,591,523		7,571,929
Axes*.....	doz.			3,905	33,756
Tools, hand or machine.....	\$		288,690		239,370
Vehicles—					
Automobiles, freight—					
One ton or less.....	No.	17,500	6,247,778	19,921	7,038,401
Over one ton.....	No.	14	24,348	3,735	1,613,900
Automobiles, passenger—					
\$500 or less.....	No.	24,922	9,129,675	42,308	14,827,725
\$500 to \$1,000.....	No.	10,552	7,620,366	10,729	7,125,407
Over \$1,000.....	No.	4,426	5,406,830	2,695	3,270,882
Total automobiles.....	No.	57,414	28,428,997	79,388	33,876,315

*April 1 to December 31, 1928.

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1927 and 1928—Continued

Classification	1927		1928	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—Concluded				
Vehicles—Concluded				
Automobile parts.....	No.	3,434,465		2,152,166
Railway cars and parts.....	No. 57	213,309	183	283,101
Tractors and parts.....	No. 8	165,635	40	38,435
Other vehicles of iron.....	\$	90,434		110,465
Total vehicles.....	\$	32,332,840		36,460,482
Chains.....	\$	156,532		157,298
Stoves.....	\$	120,127		124,326
Other iron and steel.....	\$	1,172,709		1,096,578
Total iron and its products.....	\$	67,831,374		70,665,677
NON-FERROUS METALS—				
Aluminium—				
Scrap.....	cwt. 5,435	66,534	18,003	249,066
Bars, blocks, etc.....	cwt. 519,024	10,544,195	405,971	8,049,367
Manufactures.....	\$	403,230		759,258
Brass—				
Old and scrap.....	cwt. 72,964	584,725	115,482	984,071
Valves.....	\$	248,385		261,410
Other.....	\$	515,902		603,544
Copper—				
Fine, in ore, matté, regulus.....	cwt. 728,412	7,371,542	764,279	7,023,884
Blister.....	cwt. 542,588	6,667,270	1,047,647	15,375,344
Old and scrap.....	cwt. 59,125	602,494	80,617	869,839
Bars.....	cwt. 2,481	63,165	1,582	40,988
Wire, insulated.....	\$	199,817		259,430
Other.....	\$	48,491		25,930
Total copper.....	\$	14,952,779		23,595,415
Lead—				
In ore.....	cwt. 130,326	844,637	149,629	893,709
Pig.....	cwt. 2,394,091	11,981,388	2,554,217	10,172,075
Nickel—				
In matte.....	cwt. 364,588	5,784,623	363,708	5,457,222
Nickel oxide.....	cwt. 51,961	1,600,986	96,072	3,004,951
Fine.....	cwt. 290,158	7,896,211	511,887	13,320,034
Precious Metals—				
Gold-bearing quartz, dust, etc.....	\$	7,881,512		10,457,877
Silver in ore, concentrates, etc.....	Oz. 5,445,117	2,894,386	6,815,691	3,824,385
Silver bullion.....	Oz. 15,970,961	8,995,040	14,592,406	8,456,968
Other.....	\$	404,530		542,310
Total precious metals.....	\$	20,175,468		23,281,540
Zinc—				
Ore.....	tons *25,227	862,498	†11,255	1,438,619
Spelter.....	cwt. 1,124,204	6,826,808	1,271,885	6,602,867
Scrap, dross and ashes.....	cwt. 58,771	178,562	69,440	203,884
Clocks and watches.....	\$			173,972
Miscellaneous—				
Electric apparatus.....	\$	1,725,835		2,218,616
Coalt ore.....	\$	242,741		530,897
Cobalt, metallic.....	lb. 354,908	707,709	240,966	467,663
Ores, n.o.p.....	tons 133	3,168	15	687
Other non-ferrous metals.....	\$	910,766		1,019,737
Total non-ferrous metals.....	\$	87,057,150		103,288,613
NON-METALLIC MINERALS—				
Asbestos.....	tons 133,225	8,697,376	129,192	8,802,558
Asbestos sand.....	tons 130,065	2,037,935	135,729	2,177,729
Asbestos mfrs.....	\$	66,334		65,895
Porcelain insulators.....	\$	155,196		124,140
Other clay and products.....	\$	127,516		160,378
Coal (incl. lignite).....	tons 1,113,330	5,890,259	863,941	4,469,999

*1927—Zinc ore exported.

†1928—Zinc contained in ore exported.

Table 27.—Principal Exports of Canadian Mineral Products during the Calendar Years 1927 and 1928—Concluded

Classification	1927		1928	
	Quantity	Value \$	Quantity	Value \$
Non-Metallic Minerals—Con.				
Coal Products—				
Cinders.....		16,218		11,713
Coke..... tons	91,533	892,641	44,915	625,862
Tar..... gal.	2,914,642	277,793	3,572,781	311,031
Glass and glassware.....		128,958		150,265
Graphite..... cwt.	33,989	102,476	21,065	45,384
Mica splittings..... cwt.	3,189	213,651	1,679	80,902
Other mica.....		113,195		94,859
Petroleum and its Products—				
Petroleum, crude..... gal.	18,793,254	923,948	21,531,929	1,098,586
Kerosene, refined..... gal.	1,759,838	191,533	1,297,081	127,391
Gasoline and naphtha..... gal.	2,463,379	431,011	3,957,557	686,256
Other oil..... gal.	258,251	81,147	279,946	85,014
Wax..... cwt.	3,609	21,327	10,010	54,501
Stone and its Products—				
Abrasives, artificial..... cwt.	1,000,321	2,645,347	1,235,302	3,295,460
Grindstones.....		50,866		28,747
Gypsum, crude..... tons	588,808	959,858	824,536	1,240,987
Lime..... cwt.	421,382	367,939	400,852	357,085
Cement, portland..... cwt.	873,929	308,144	935,638	340,624
Feldspar..... tons	28,648	225,955	28,101	230,945
Sand and gravel..... tons	637,624	177,999	797,111	232,422
Talc, refined..... cwt.	214,070	125,277	218,915	133,601
Other.....		346,779		506,122
Other non-metallic minerals.....		766,671		856,964
Total non-metallic minerals.....		26,343,349		26,395,420
CHEMICALS AND ALLIED PRODUCTS—				
Acid, acetic..... cwt.	277,531	2,860,393	402,027	3,927,337
Acid, sulphuric..... cwt.	348,142	181,926	266,586	152,544
Acids, other..... cwt.	3,084	9,805	15,197	11,542
Wood alcohol..... gal.	47,026	49,083	27,380	23,514
Other industrial spirits.....		15,321		21,090
Drugs, medicinal.....		487,904		590,049
Dyeing and tanning materials.....		1,721		1,192
Explosives.....		179,738		218,324
Fertilizers—				
Ammonium sulphate..... cwt.	338,935	730,815	272,637	561,696
Cyanamid..... cwt.	2,217,349	4,623,461	2,710,526	4,759,810
Other mfd., n.o.p..... cwt.	21,484	25,306	45,710	49,330
Paints, pigments and varnishes.....		428,548		502,970
Soap, toilet..... lb.	5,283,306	811,000	4,996,008	662,975
Soap, n.o.p..... lb.	493,077	40,258	416,405	33,539
Inorganic Chemicals, n.o.p.—				
Arsenic, n.o.p..... cwt.	38,566	124,823	31,949	122,106
Acetate of lime..... cwt.	70,725	232,630	99,365	356,845
Calcium carbide..... cwt.	268,376	913,498	253,169	837,912
Soda and sodium compounds..... cwt.	732,026	3,889,640	639,294	3,711,376
Cobalt oxide and salts..... lb.	379,136	668,788	369,783	650,981
Other.....		109,300		134,151
Total inorganic chemicals, n.o.p.....		5,938,679		5,813,371
Creosote oil..... gal.	3,472,566	588,663	1,150,766	188,191
Glycerine..... cwt.	9,362	136,237	3,137	23,448
Other drugs, dyes and chemicals.....		736,057		1,003,914
Total chemicals and allied products.....		17,854,915		18,544,836

Table 28.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1928.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	\$	\$	\$	\$	\$	\$	\$	\$
BRITISH EMPIRE								
United Kingdom.....	17,762,561	8,416,250	6,293,022	15,034,819	11,889,385	1,645,393	4,753,371	4,348,490
Irish Free State.....		33,851		5,800		3,581	730	20,481
Aden.....		21,514						
Africa—								
British East.....		1,286,895		8,095				410
British South.....	497	2,953,139	22	298,049	32,136	48,070	385	33,844
British West—								
Gambia.....		18,704						
Gold Coast.....		352,526	940,475	74		22		5,801
Nigeria.....		338,438						
Sierra Leone.....		44,057				3,572		
Other Br. W. Africa.....		1,029						
Bermuda.....	6,792	23,355	799	10,014	61	14,956	101	21,883
Br. East Indies—								
British India.....	1,474	6,377,739	78,718	2,239,110	28,040	27,032	3,879	90,469
Ceylon.....		486,575	339	12,914				5,394
Straits Settlements.....		610,676	396,140	38,371				1,028
Other Br. East Indies.....		6,599		727			1,611	
British Guiana.....	46,710	143,495	9,020	21,757		98,339		33,975
British Honduras.....	1,330	27,079		817		6,516		5,637
British Sudan.....		142,394		9,164				
Br. West Indies—								
Barbados.....	16,600	145,520	1,030	5,929	3	12,461	5	37,759
Jamaica.....	4,783	529,889	854	6,092		40,285	6,935	59,892
Trinidad and Tobago.....	16,633	325,805	2,115	20,263		18,947		75,253
Other Br. West Indies.....	17,055	116,821	6,003	5,786	49,756	35,082	1,276	42,587
Gibraltar.....						23,882		
Hong Kong.....	1,426	111,364	2,710	6,158	9,627	402	98,801	157,427
Iraq (Mesopotamia).....		150,516				1,328		182
Malta.....		254,672		425				
Newfoundland.....	652,372	767,468	501	157,586	169,738	1,940,580	52	577,094
Oceania—								
Australia.....	1,395	7,387,236	1,095	321,710		303,309	2,264	198,556
Fiji.....		87,234		1,037				
New Zealand.....	76	5,421,763		729,266	5	266,021		131,778
Other Oceania.....		13,680						
Palestine.....		61,957	255		61			
Total British Empire..	18,529,704	36,658,240	7,733,098	18,933,963	12,178,832	4,489,791	4,870,022	5,847,960
FOREIGN COUNTRIES								
Argentina.....	1,254	6,784,262	132	156,969		31,818	33,153	1,407
Austria.....	15,636	39,382	79,205	14,751	15,462	300	6,324	
Belgium.....	3,456,048	75,469	405,217	2,591,122	3,711,644	383,416	428,339	146
Bolivia.....		54,482						
Brazil.....		3,162,412		437,374		45,732		4,348
Bulgaria.....								
Chile.....		1,320,449		29,466		1,431	370,177	39,797
China.....	3,980	284,549	74,202	4,394,379	7,535	4,378	25,322	196,872
Colombia.....		315,576		32,745	6,547,130	74,385		16,216
Costa Rica.....		50,212		135		1,563		8,062
Cuba.....		40,432	430	107,298	214	10,001		310,328
Czecho-Slovakia.....	58,372	173,138	112,747	23	870,931	13,908	12,166	
Denmark.....	27,272	771,566	5,406	18,433	4,969	22,931	3,771	63
Ecuador.....		72,052		131	111,004	25		1,696
Egypt.....		658,406	81	332	39	38		858
Estonia.....		730						
Finland.....	38,721	38,406		9	23,932	882	9	
France.....	728,302	413,709	500,955	1,668,792	652,332	761,489	1,345,165	20,277
French Africa.....	53,073	287,189	70		40	49,842		
French West Indies.....		43,762				10,348		
St. Pierre and Miquelon.....	180	36,198		1,791		93,404	36	10,859
Germany.....	2,872,615	1,388,236	1,444,756	5,039,518	1,343,410	1,440,864	3,100,206	18,187
Greece.....		34,144		417	409			
Guatemala.....		75,211		3,206		3,678		1,061
Hayti.....		69,655						19
Honduras.....		4,043		82		3,976		35,382
Hungary.....								
Italy.....	36,838	135,541	130,828	570,897	186,622	348,794	96,824	
Japan.....	8,400	563,918	224,079	7,048,486	499,565	563,808	100,487	244,882
Korea.....		15,852	1,629					1,529
Lettonia (Latvia).....		72,609						
Mexico.....	5	90,613		243,516	307,337	23,226		1,608,807
Morocco.....	10	276,627				82		12
Netherlands.....	111,290	309,604	71,236	5,025,297	964,183	277,936	724,547	
Dutch East Indies.....		1,827,070		110,273	2,337	2,148		34,409
Dutch Guiana.....		3,986	52,592	75				254
Dutch West Indies.....		35,095		267	340,821			7,745

Table 28.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1928.—Concluded.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	\$	\$	\$	\$	\$	\$	\$	\$
FOREIGN COUNTRIES—Con.								
Nicaragua.....								76
Norway.....	71,946	231,578	6,521	52,887	7,201	94,534	347	
Panama.....		395,200		792		4,175		6,957
Paraguay.....		103,751					35,325	
Persia.....		81,050						
Peru.....		373,049		10,238	4,257,444	30,013		14,029
Poland and Danzig.....	3,910	164,492	107	24,778	12	2,491		
Portugal.....		10,208	12	206	172	12,829		231
Azores and Madeira.....				292		64		
Portuguese Africa.....		166,491		3,755		1,534		293,331
Roumania.....		505,544		5,589				
Russia.....		968,982	3,382	65,764	29,887	2,166		2,965
Salvador.....								
San Domingo.....		23,268		2,416				14,399
Siam.....		31,991			11,709			
Spain.....	20,542	248,831	935	206,637	45,251	74,239	14,290	76,440
Canary Islands.....								
Sweden.....	1,670,362	167,405	208,490	951	38,749	58,406	18,030	
Switzerland.....	129,987	49,032	1,640,344	40,391	10,710	150	345,785	264
Syria.....	58	126,103	4,714		116	1,998	912	98
Turkey.....	19	56,151	131		147	2,298	3,375	
United States.....	295,114,281	9,216,896	56,023,758	56,417,856	129,617,884	17,313,405	25,428,284	9,378,994
Alaska.....	6,338	1,121		357	3,733	281,673	102	
Hawaii.....		5,070				67		2,848
Philippine Islands.....	1	562	46	125		7,485		34,909
Porto Rico.....		1,856		96		1,650		4,868
Uruguay.....		490,849		5,526		12,653		105,800
Venezuela.....		572,292		7,512	378,913	385		9,260
Other Foreign Countries.....		491,080	214,276	12,698	1,751	844	696	
Total Foreign Countries.....	304,429,440	34,007,437	61,206,281	84,354,650	149,993,595	22,093,820	32,093,672	12,508,685
Grand Total.....	322,959,144	70,665,677	68,939,379	103,288,613	162,172,427	26,583,611	36,963,694	18,356,645

UNITED STATES TARIFF RATES ON MINERAL PRODUCTS IMPORTED

Since Canadian producers of mineral products market a large part of their annual output in the United States it was thought it might be of value to readers of this report to have at hand a guide to *United States Tariff* and the following tables were therefore compiled. These have been checked by the *Customs Division* of the *United States Treasury Department* at Washington, D.C., U.S.A.

Table 29.—United States Tariff

Item Number	Material	Duty
(a) On Metals and Manufactures of		
1508	Antimony ore.....	Free
1547	Chromite—Chromite or chrome ore.....	Free
1550	Cobalt metal and ore.....	Free
29	Cobalt linoleate.....	10c. per lb.
29	Cobalt, oxide of.....	20c. per lb.
29	Cobalt salts and compounds (all other).....	30% ad val.
29	Cobalt sulphate.....	10c. per lb.
1457	Cobalt ore waste.....	10% ad val.
1556	Copper ore, regulus of, and black or coarse copper, and cement copper, old copper, fit only for re-manufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs not manufactured or specially provided for.....	Free
1557	Copper sulphate or blue vitriol, copper acetate and subacetate.....	Free
381	Copper in rolls, rods or sheets.....	2½c. per lb.
	Engraver plates, not ground and seamless copper tubes and tubing.....	7c. per lb.
	Engravers plates, ground, and brazed copper tubes.....	11c. per lb.
	Brass rods, sheet brass, brass plates, bars, and strips, Muntz or yellow metal sheers, metal sheathing, bolts, piston rods and shafting.....	4c. per lb.
	Seamless brass tubes.....	8c. per lb.

Table 29.—United States Tariff—Continued

Item Number	Material	Duty
(a) On Metals and Manufactures of—Concluded		
	Brazed brass tubes, angles and channels.....	12c. per lb.
	Bronze rods and sheets.....	4c. per lb.
	Bronze tubes.....	8c. per lb.
1529	Bullion gold or silver.....	Free
1634	Gold ores and sweepings.....	Free
1597	Iron ore including manganese iron ore and residuum from burnt pyrites.....	Free
1677	Sulphur in any form, and sulphur ore, and spent oxide of iron containing more than 25 per centum of sulphur.....	Free
392	Lead bearing ores and mattes—duty applied on lead contents, such duty shall not be applied to the lead contained in copper mattes unless actually recovered.....	1½c. per lb.
393	Lead bullion or base bullion, lead in pigs and bars, dross, reclaimed lead, scrap lead, antimonial lead, antimonial scrap lead, type metal, Babbitt, solder and all other combinations not specially provided for, duty to apply on lead contents.....	2½c. per lb.
47	Lead in sheets, pipe, shot, glazier's lead and lead wire.....	2½c. per lb.
74	Lead litharge of.....	30% ad val.
302	Manganese ore or concentrates containing in excess of 30 per centum of metallic manganese.....	2½c. per lb.
		1c. per lb. on metallic manganese content.
302	Molybdenum ore or concentrates.....	35c. per lb. on metallic molybdenum content.
302	Tungsten ore or concentrates.....	45c. per lb. on metallic tungsten content.
1634	Nickel mattes and ores of nickel.....	Free
390	Nickel oxide.....	1c. per lb.
390	Nickel and nickel alloys in pigs, ingots, shot, cubes and similar forms.....	3c. per lb.
390	Nickel in bars, rods, sheets, strips, tubing, etc.....	25% ad val.
390	In addition thereto on the foregoing if cold rolled, drawn or worked.....	10% ad val.
1596	Platinum, palladium and other metals of the platinum group.....	Free
1644	Zinc-bearing ore of all kinds containing less than 10 per centum of zinc.....	Free
394	Containing 10 per centum or more of zinc and less than 20 per centum.....	4c. per lb. on metallic zinc content.
	Containing more than 20 per centum of zinc and less than 25 per centum.....	1c. per lb. on metallic zinc content.
	Containing 25 per centum of zinc or over.....	1½c. per lb. on metallic zinc content.
395	Zinc in blocks, pigs or slabs and zinc dust.....	1½c. per lb.
395	Zinc in sheets.....	2c. per lb.
395	Zinc scrap for re-manufacturing.....	1½c. per lb.
(b) On Non-Metallic Minerals		
1619	Actinolite—crude, classified as "minerals, crude, not specially provided for".....	Free
214	Actinolite—ground, classified as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
1513	Arsenic—white or arsenious acid.....	Free
1512	Arsenic—Sulphide of.....	Free
379	Arsenic—Metallic.....	6c. per lb.
1515	Asbestos—crudes, fibres, sand.....	Free
1401	Asbestos—yarn.....	30% ad val.
69	Barytes—ore, crude.....	\$4 per ton
69	Barytes—ore, ground.....	\$7.50 per ton.
	Calcite—not mentioned by this name in the tariff. Chalk, crude, is free (Item 1545) and chalk, ground, is dutiable at 25% ad valorem (Item 20).....	
1570	Corundum—ore.....	Free
1415	Corundum—ground.....	1c. per lb.
1619	Feldspar—crude, classified as "minerals, crude not specially provided for".....	Free
214	Feldspar—ground, dutiable as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
207	Fluorspar.....	\$5.60 per ton
	Fluorspar—from Nov. 16, 1928 fluorspar containing not more than 93 per cent, calcium fluoride.....	\$8.40 per ton
213	Graphite or plumbago—crude or refined—amorphous.....	10% ad val.
213	Graphite or plumbago—crude or refined—crystalline lump, chip or dust.....	20% ad val.
213	Graphite or plumbago—crude or refined—crystalline flake.....	1½c. per lb.
236	Grindstones—finished or unfinished.....	\$1.75 per ton
1643	Gypsum—crude.....	Free
205	Gypsum—ground.....	\$1.40 per ton
75	Iron oxides—ochers, crude.....	4c. per lb.
75	Iron oxides—ochers, washed or ground.....	4c. per lb.
75	Iron oxides—"iron-oxide pigments not specially provided for".....	20% ad val.
204	Magnesite—crude.....	15½c. per lb.
204	Magnesite—caustic calcined.....	1½c. per lb.
204	Magnesite—dead burned and grain.....	¾c. per lb.
50	Magnesium sulphate—(Epsom salts).....	4c. per lb.
208	Mica—unmanufactured, valued at not above 15 cents per pound.....	4c. per lb.
208	Mica—unmanufactured, valued above 15 cents per pound.....	25% ad val.
208	Mica—cut or trimmed, and mica splittings.....	30% ad val.
208	Mica—ground.....	20% ad val.
808	Mineral waters.....	10c. per gal.

Table 29.—United States Tariff—Concluded

Item Number	Material	Duty
(b) On Non-Metallic Minerals—Concluded		
1640	Phosphate—"phosphates, crude".....	Free
1677	Pyrites—"sulphur ore, such as pyrites or sulphuret of iron in its natural state, and spent oxide of iron, containing more than 25% of sulphur".....	Free
83	Salt—in bags, sacks, barrels, or other packages.....	11c. per cwt.
83	Salt—in bulk.....	7c. per cwt.
83	Sodium sulphate—crystallized or Glauber's salt.....	\$1.00 per ton
1667	Sodium sulphate, crude or salt cake.....	Free
207	Silica—crude, not specially provided for.....	\$4 per ton
207	Silica—for use as pigment, not specially provided for.....	\$7.50 per ton
209	Talc—crude.....	4c. per lb.
209	Talc—ground, washed, powdered, or pulverized (except toilet preparations).....	25% ad val.
1675	Tripoli—crude or manufactured, not specially provided for.....	Free
(c) On Structural Materials and Clay Products		
Clay Products—		
201	Brick—bath, chrome and fire, n.s.p.f.....	25% ad val.
	Magnesite brick.....	4c. per lb. and 10% ad val.
1536	Brick—not specially provided for.....	*Free
207	China clay or Kaolin.....	\$2.50 per ton
207	Clays or earths, unwrought or unmanufactured, including common blue clay and Gross-Almerode glass pot clay, n.s.p.f.....	\$1.00 per ton
207	Clays or earths, wrought or manufactured, n.s.p.f.....	\$2.00 per ton
210	Earthenware—common yellow, brown or gray made of natural, unwashed, and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing ornamented, incised, or decorated in any manner.....	15% ad val.
210	Earthenware—common yellow, brown, or gray earthenware made of natural, unwashed and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing ornamented, incised, or decorated in any manner and manufactures wholly or in chief value of such ware, n.s.p.f.....	20% ad val.
210	Earthenware—Rockingham.....	25% ad val.
203	Lime—n.s.p.f., including weight of container.....	10c. per cwt.
203	Lime—hydrated, including weight of container.....	12c. per cwt.
237	Slates—slate chimney pieces, mantles, slabs for tables, roofing slates, and all other manufactures of slate, n.s.p.f.....	15% ad val.
Stone—		
203	Limestone—(not suitable for use as monumental or building stone) crude, or crushed but not pulverized.....	5c. per cwt.
235	Limestone, freestone, granite, sandstone, lava and all other stone suitable for use as monumental or building stone, except marble, breccia, and onyx, n.s.p.f., hewn, dressed, or polished, or otherwise manufactured.....	50% ad val.
235	Unmanufactured, or not dressed, hewn or polished.....	15c. per cubic ft.
232	Marble, breccia and onyx, in block, rough or squared only.....	65c. per cubic ft.
232	Marble, breccia and onyx, sawed or dressed, over two inches in thickness.....	\$1.00 per cubic ft.
232	Marble, breccia and onyx slabs and paving tiles, containing not less than four superficial inches, if not more than one inch in thickness.....	8c. per superficial foot
	If more than one inch and not more than one and one-half inches in thickness.....	10c. per superficial foot
	If more than one and one-half inches and not more than two inches in thickness.....	13c. per superficial foot
	If rubbed in whole or in part.....	3c. per superficial foot in addition.
	Mosaic cubes of marble, breccia, or onyx, not exceeding two cubic inches in size, if loose.....	One-fourth of one cent per lb. and 20% ad val.
	If attached to paper or other material.....	5c. per superficial foot and 35% ad val.
1675	Stone and sand: burrstone in blocks, rough or unmanufactured; quartzite; traprock; rottenstones; tripoli and sand, crude or manufactured; cliff stone; freestone; granite and sandstones; unmanufactured, and not suitable for use as monumental or building stone; all of the foregoing n.s.p.f.....	Free

*Except on imports from countries which impose a duty on similar products imported from U.S. On imports of these commodities a corresponding duty is levied.

Table 30.—Accidents in the Mining Industry in Canada, by Provinces*, 1928

Cause of Accident		Nova Scotia		New Brunswick		Quebec		Ontario		Saskatchewan		Alberta		British Columbia		Canada	
		Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal
UNDERGROUND—																	
Falls of roof or face.....		14	905	2	49	6	59	5	136	.....	8	9	75	8	315	44	1,547
Mine cars and locomotives.....		7	566	.....	18	.....	42	6	157	.....	18	9	41	2	235	24	1,077
Gas and dust explosions.....		1	7	.....	1	.....	7	6	9	24	.....	.....	2	8	4	9	14
Explosives.....		.....	2	.....	7	.....	6	9	24	.....	.....	.....	7	3	19	19	63
Electricity.....		.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	5
Miscellaneous.....		2	734	.....	129	1	173	53	1311	1	6	7	31	7	819	71	3,203
Total.....		24	2214	2	204	14	280	73	1628	1	32	25	157	28	1394	167	5,909
SURFACE—																	
Haulage and cars.....		.....	34	.....	12	1	28	1	55	.....	1	1	10	.....	54	3	194
Machinery.....		2	40	.....	3	2	30	.....	75	.....	1	.....	.....	79	4	228	.....
Miscellaneous.....		2	287	.....	5	7	78	11	757	.....	.....	2	26	.....	461	22	1,614
Total.....		4	361	.....	20	10	136	12	887	.....	2	3	36	.....	594	29	2,036
Grand Total.....		28	2575	2	224	24	416	85	2515	1	34	28	193	28	1988	196	7945

*Data for Manitoba not available.

CHAPTER TWO

The Provinces

NOVA SCOTIA

Because of its geographical position on the Atlantic seaboard, Nova Scotia was one of the first provinces to have its mineral resources explored. This was done by Master Simon, a mining engineer who, with the famous explorer Champlain, accompanied a French colonizing expedition under de Monts. Master Simon reported a discovery, in 1604, of iron and silver in St. Mary's bay and native copper at Cape d'Or. The first mention of coal, though it was no doubt known to exist before, was made by Nicolas Denys in his *Description and Natural History of Acadia* published in 1672. This in fact was the first mention of coal on the North American continent. Denys also noted the existence of gypsum or "plaister" on the Antigonish river, on the Bras d'Or lakes, at St. Ann's bay and at Mabou. Coal and gypsum mining are still the two most important mining industries of the province.

Protective tariff provisions designed to promote the coal-mining industry in Nova Scotia were made in 1877, when a duty was placed on American soft coal entering Canada; this made it possible for the Nova Scotia mine operators to compete with United States producers successfully in the markets along the St. Lawrence river. With the advent of the steel industry, using the iron ore from Newfoundland, the consumption of coal was further increased.

Gold was discovered in Nova Scotia about the year 1860, and the auriferous area has been variously estimated to represent from 3,000 to 5,000 square miles. Considerable work has been done on these gold ores, many of which contain arsenic, but of late there has not been much to report except that in the year 1923 when the price of arsenic was high, production was stimulated for a time.

In addition to coal, gypsum and gold, Nova Scotia also produces some arsenic and silver barytes, grindstones, diatomite, quartz, salt, silica brick, clay products, lime, sand and gravel and stone.

Since the year 1785 the total coal production of Nova Scotia has amounted to 231,911,138 short tons valued at \$596,790,659.

Table 31.—Mineral Production of Nova Scotia, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Arsenic..... lb.			35,000	700		
Gold..... fine oz.	1,678	34,687	3,151	65,137	1,290	26,667
Silver..... fine oz.	112	70	125	70	77	45
NON-METALLICS—						
Barytes..... tons	100	2,307	56	1,268	127	2,847
Coal..... tons	6,747,477	26,845,226	7,071,876	27,194,671	6,743,504	27,427,556
Diatomite..... tons			266	6,650	208	4,160
Grindstones..... tons	311	15,136	11	220		
Gypsum..... tons	678,107	1,187,918	829,438	1,512,015	1,013,257	1,850,243
Quartz..... tons	8,333	29,018	4,834	16,721	7,424	28,022
Salt..... tons	8,165	68,781	14,391	102,590	19,604	118,342
Silica brick..... M	1,358	64,461	1,238	50,978	1,627	69,179
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		362,667		416,417		496,577
Lime..... tons	15,883	59,777	30,562	100,254	36,154	175,876
Sand and gravel..... tons	230,307	52,952	812,976	522,723	296,266	111,103
Stone..... tons	92,315	150,792	72,451	120,807	121,168	213,775
Total.....		28,873,792		30,111,221		30,524,392

Table 32.—Number of Plants and Capital Employed in the Mineral Industry of Nova Scotia by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz	13	5,748,262	210,109	161,579	6,119,950	8	1,281,007	4,563	4,485	1,290,055
Coal	40	46,918,464	3,444,755	6,758,456	57,121,675	40	47,063,302	3,184,255	6,999,893	57,247,450
Gypsum	14	3,747,108	362,006	237,210	4,346,324	14	4,440,028	417,152	76,399	4,933,579
Clay products	10	847,120	139,294	86,983	1,073,397	9	836,452	140,551	77,394	1,054,397
Sand and gravel	10					11				
Stone	8	1,115,816	26,422	784	1,143,022	12	1,103,499	19,257	5,192	1,127,948
†All other mines	12	865,992	35,122	228,983	1,130,097	10	1,545,235	35,006	95,855	1,676,096
Total	107	59,242,762	4,217,708	7,473,995	70,934,465	104	56,269,523	3,800,784	7,259,218	67,329,525

† Includes data for 1 silver-lead-zinc mine, 1 tungsten mine 2 quartz mines, 1 salt mine, 3 natural abrasive plants, 2 lime plants, 1 barytes mine and 1 silica brick plant in 1927 and for 1 silver-lead-zinc mine, 1 tungsten mine, 2 lime plants, 2 quartz mines, 1 salt mine, 1 natural abrasives plant, 1 silica brick plant and 1 barytes mine in 1928.

Table 33.—Employees, Salaries and Wages in the Mineral Industry of Nova Scotia, 1927 and 1928

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1927					\$	\$	\$
Auriferous quartz	13	1	248	262	19,395	167,803	187,198
Coal	479	35	13,317	13,831	1,023,809	15,676,318	16,700,127
Gypsum	25	4	939	968	70,537	695,789	766,326
Clay products	8	1	197	206	28,100	141,200	169,300
Sand and gravel			135	135		15,050	15,050
Stone	5		78	83	5,504	57,773	63,277
All other mines	8	2	168	178	14,557	160,287	174,844
Total	538	43	15,082	15,663	1,161,902	16,914,220	18,076,122
1928							
Auriferous quartz	9		87	96	15,872	59,300	75,172
Coal	483	41	13,333	13,857	1,055,313	18,885,377	19,940,690
Gypsum	26	5	688	719	65,948	572,173	638,121
Clay products	9	2	212	223	31,035	154,543	185,578
Sand and gravel			195	195		47,787	47,787
Stone	6		86	92	9,195	79,217	88,412
All other mines	15	2	298	315	31,876	241,417	273,293
Total	548	50	14,899	15,497	1,209,239	20,039,814	21,249,053

*See note page 31.

NEW BRUNSWICK

Although there are many minerals of economic importance in the province of New Brunswick, development of these resources has not been so rapid as in other provinces of the Dominion probably because of the general concealment of the rocks by forests, which adds to the difficulty of locating mineralized areas suitable for commercial development. Actual mining has not progressed therefore to the extent that geological indications would warrant and very little of the province has been prospected.

At present, activities are restricted mainly to the mining of bituminous coal, the quarrying of gypsum and stone, and the production of petroleum, natural gas, lime and clay products.

The first discoveries of bituminous coal were made in the vicinity of Grand lake, Queens county, and small quantities were obtained from that region in 1782.⁽¹⁾ At the present time coal is found at several places in the broad carboniferous belt, extending westward from the coast, in Albert and Kent counties through Kings, Queens, Sunbury and York. There is a well-known deposit near Minto, Grand lake district, at Beersville on the coal branch of the Richibucto rim and at Dunsinane, 30 miles southwest of Moncton, but it has been worked economically only in the vicinity of Minto. Here, the seam runs from 16 to 30 inches in thickness and is found at various depths down to 120 feet.

Gypsum ranks next to coal and is found in localized deposits. It is quarried at Hillsborough and part of the production is there made into plaster by the Albert Manufacturing Company, who have a large and well-equipped plant.

Natural gas and petroleum produced in New Brunswick come from the Stoney Creek district south of Moncton. Extensive deposits of bituminous or oil-shales occur in Albert and Westmorland counties near Moncton, but as yet these have not been worked commercially.

Other materials such as wolframite—the ore of tungsten—copper in the form of chalcopyrite, iron ore in the form of siliceous magnetite, antimony, manganese and tripolite have also been located but production of these minerals is very limited.

The total recorded coal production of New Brunswick until the end of 1928 amounted to 3,523,581 short tons valued at \$13,482,239; the year of greatest output was 1922 when 287,513 short tons were mined. Production in 1928 from the 15 mines amounted to 207,738 short tons valued at \$869,104.

¹ W. G. Raymond, *Proceedings of the Historical Society of St. John*, 1897.

Table 34.—Value of Mineral Production of New Brunswick, 1899-1928

Year	Value	Year	Value
	\$		\$
1899.....	420,227	1914.....	1,014,570
1900.....	439,060	1915.....	903,467
1901.....	467,985	1916.....	1,118,187
1902.....	607,129	1917.....	1,435,024
1903.....	580,495	1918.....	2,144,017
1904.....	559,913	1919.....	1,770,945
1905.....	559,035	1920.....	2,491,787
1906.....	646,328	1921.....	1,901,505
1907.....	664,467	1922.....	2,263,692
1908.....	579,816	1923.....	2,462,457
1909.....	657,035	1924.....	1,969,260
1910.....	551,942	1925.....	1,743,858
1911.....	612,830	1926.....	1,811,104
1912.....	771,004	1927.....	2,148,535
1913.....	1,102,613	1928.....	2,198,919

Table 35.—Mineral Production of New Brunswick, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Antimony..... tons						
Manganese ore..... tons						
NON-METALLICS—						
Coal..... tons	173,111	710,245	203,950	885,038	207,738	869,104
Grindstones..... tons	1,684	90,975	1,860	97,197	1,609	80,451
Gypsum..... tons	59,546	468,411	85,293	524,550	75,033	501,252
Manganese, Bog..... tons					385	2,237
Natural gas..... M cu. ft.	648,316	128,300	630,755	124,637	660,981	324,344
Petroleum..... bbl.	10,544	29,940	18,244	41,748	8,043	21,391
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		75,851		87,185		72,192
Lime..... tons	16,703	196,477	12,009	148,321	11,261	130,784
Sand and gravel..... tons	70,931	11,360	388,066	118,768	491,471	54,183
Stone..... tons	19,108	99,545	29,908	121,091	46,332	142,981
Total.....		1,811,104		2,148,535		2,198,919

Table 36.—Number of Plants and Capital Employed in the Mineral Industry of New Brunswick, by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Coal mining.....	14	1,401,391	30,747	94,326	1,526,464	15	1,432,033	24,687	188,584	1,645,304
Clay products.....	3	70,700	24,092	34,210	129,002					
Lime.....	5	153,630	37,211	54,424	245,265	4	107,500	28,450	11,500	147,450
Stone.....	11	120,792	32,879	17,350	171,021	12	138,811	22,727	36,341	197,879
†All other mines.....	46	730,365	113,059	99,438	942,862	66	865,605	150,163	324,937	1,340,705
Total.....	79	2,476,878	237,988	299,748	3,014,614	97	2,543,949	226,027	561,362	3,331,338

† Includes data for 1 antimony mine, 38 natural gas wells, 2 gypsum quarries, 2 natural abrasive plants and 3 sand and gravel pits in 1927; and for 1 antimony mine, 2 clay products plants, 28 natural gas wells, 25 petroleum wells, 2 gypsum mines, 1 bog manganese, 2 natural abrasive plants, and 5 sand and gravel pits in 1928.

Table 37.—Employees, Salaries and Wages in the Mineral Industry of New Brunswick, 1927 and 1928

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927					\$	\$	\$
Coal mining.....	27	2	558	587	50,968	570,043	621,011
Clay products.....	7	1	51	59	9,811	32,184	41,995
Lime.....	10		62	72	16,400	50,198	66,598
Sand and gravel.....			75	75		12,498	12,498
Stone.....	10		94	104	12,810	56,611	69,421
All other mines.....	18	5	276	299	72,614	208,754	281,368
Total.....	72	8	1,116	1,196	162,603	930,288	1,092,891
1928							
Coal mining.....	25	2	585	612	48,800	553,447	602,247
Lime.....	7	2	58	67	16,540	47,501	64,041
Sand and gravel.....			74	74		13,449	13,449
Stone.....	10	1	89	100	24,568	77,479	102,047
All other mines.....	22	7	362	391	93,436	232,242	325,678
Total.....	64	12	1,168	1,244	183,344	924,118	1,107,462

*See note page 31.

QUEBEC

Quebec is the largest of all the Canadian provinces. It has a land area and water area of 706,834 square miles, and comprises the territory lying between the Hudson bay and Hudson strait and Labrador on the north, the gulf of St. Lawrence on the east, the province of New Brunswick and the United States on the south, and the province of Ontario on the west. Only the southern part of the province has ever been examined for mineralized areas, and until recently interest has been focussed on the non-metallic minerals of the province, as the main source of mineral wealth. In 1922, copper ores carrying gold were discovered in what is commonly called northern Quebec, but this term really refers to a section lying south of the main line of the Canadian National Railway, and just east of the Ontario boundary; it is a continuation of the mineralized belt of the Kirkland lake area that has added to Ontario's prominence as a mining area during recent years.

Since that time the Horn mine a very important copper-gold property has been developed; a smelter has been built and put in successful operation and when other properties in the vicinity are brought to the producing stage, customs ore will be treated by it.

So far, the non-metallics have provided the greater part of the mineral output. Asbestos is the most important mineral product of Quebec. Other non-metals, arranged in order of their relative importance are: mica, magnesite, feldspar, quartz, iron oxides, pyrites, soapstone, and graphite. In the older and better known sections of the province there are copper, lead and zinc properties, which are operated on a small scale. Molybdenite and chromite have also been mined at different times when the market warranted an output of these minerals.

In recent years the development of hydro-electric power in Quebec has proven a great stimulus to industrial activity, particularly in the Shawinigan Falls area. A new power site at Chute à Caron on the Saguenay river has been developed and was put in operation in 1926; the chief industry in this section is the manufacture of aluminium metal from imported bauxite ores.

Table 38.—Mineral Production of *Quebec, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Copper..... lb.	2,674,058	368,886	3,119,848	403,084	33,697,949	4,909,791
Gold..... fine oz.	3,680	76,072	8,331	172,217	60,006	1,240,434
Iron ore, sold for export..... tons	200	600	2,029	8,980	2,244	6,732
Lead..... lb.	3,729,636	251,788	6,496,577	341,461	6,218,336	284,520
Molybdenite..... lb. (MoS ₂)	20,943	10,472				
Silver..... fine oz.	375,986	233,513	740,864	417,625	908,959	528,796
Zinc..... lb.	12,904,176	956,199	17,189,046	1,064,690	21,057,760	1,156,745
NON-METALLICS—						
Asbestos..... tons	279,389	10,095,488	274,778	10,621,013	273,033	11,238,360
Feldspar..... tons	13,168	111,136	12,730	104,618	12,943	104,789
Garnets..... tons			2	150		
Graphite..... tons	326	29,516	34	2,043	50	4,668
Magnesite..... tons	4,571	137,431	7,337	230,309	13,195	346,990
Mica..... tons	1,664	170,118	1,454	99,194	1,101	54,224
Mineral water..... Imp. gal.	6,956	2,444	10,330	1,813	15,415	5,608
Iron oxides..... tons	6,518	100,923	5,931	102,186	5,278	109,383
Phosphate..... tons	40	800	31	399	91	1,126
Pyrites..... tons	14,100	42,117	13,021	42,795	†1,552	12,061
Quartz..... tons	24,550	107,779	49,141	132,615	64,577	143,067
Talc and soapstone..... tons		885	1,276	51,504		40,171
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	3,727,377	4,535,386	4,636,751	5,383,058	4,913,820	6,305,396
Clay products.....		2,702,298		2,734,738		3,097,295
Lime—						
Quicklime..... tons	87,815	667,480	97,078	725,876	102,859	795,999
Hydrated lime..... tons	11,922	98,636	10,576	80,789	11,271	100,783
Sand and gravel..... tons	5,233,696	1,490,674	8,615,738	1,880,931	8,136,341	1,701,282
Stone..... tons	2,305,734	3,728,228	2,534,531	4,268,315	2,992,192	4,849,200
Total.....		25,956,193		28,870,403		37,037,420

* There is also in this province an important production of aluminium from imported ores.

†Sulphur contents of pyrites.

Table 39.—Net Income from Sales of Products from the Mineral Industry of Quebec, 1927 and 1928

Industry	1927	1928
	\$	\$
Metal mining and metallurgical industries.....	*13,155,451	*19,720,909
Non-metal mining industries.....	11,388,639	12,060,447
Clay products and structural material industries.....	15,073,707	16,849,955
Total.....	39,617,797	48,631,311

*Mine shipment values reported as received f.o.b. shipping point (i.e. gross value less freight and treatment charges) plus smelter sales less the cost of ores treated.

Table 40.—Number of Plants and Capital Employed in the Mineral Industry of Quebec, by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz						5	1,779,802	70,958	150,349	2,001,109
Copper-gold	91	9,458,800	263,844	2,950,782	12,673,426	129	14,766,533	447,006	3,492,418	18,705,947
Silver-lead-zinc	5	2,910,000	62,509	817,505	3,789,014	7	855,028	47,802	858,116	1,761,546
Asbestos	13	30,837,295	1,686,084	2,793,442	35,316,821	14	32,262,729	1,850,799	1,591,684	35,705,212
Feldspar	17	143,281	17,330	46,565	207,176	13	68,681	12,503	65,427	146,611
Iron oxides	3	133,719	18,948	650	153,317	3	134,854	18,924	49,473	154,251
Mica	12	103,698	56,952	47,624	208,274	7	97,351	58,408	49,017	204,776
Quartz	7	228,795	7,180	35,497	271,472	7	486,253	2,200	17,583	506,036
Clay products	20	9,282,883	802,820	686,019	10,771,722	20	9,644,445	961,729	788,032	11,394,206
Cement	3	12,475,813	1,203,552	991,264	14,670,629					
Lime	15	1,176,779	179,793	359,822	1,716,394	13	1,279,684	179,843	306,665	1,766,192
Sand and gravel	2,098	1,105,340	32,530	123,436	1,261,306	2,072	1,076,843	36,477	120,501	1,233,821
Stone	125	3,295,983	593,599	811,303	4,700,885	108	3,923,816	606,103	975,481	5,505,400
*All other industries	19	19,169,847	4,617,160	1,241,511	25,028,518	20	37,852,229	10,242,685	6,170,508	54,265,422
Total	2,428	90,322,233	9,542,301	10,905,420	110,769,954	2,418	104,228,838	14,535,437	14,586,254	133,350,529

† Includes data for 2 iron ore mines, 1 molybdenite mine, 3 metallurgical plants, 3 talc and soapstone quarries, 1 graphite mine, 3 magnesite mines, 3 mineral water plants, 1 phosphate mine, 1 pyrites mine and 1 garnet property in 1927; and for 1 iron ore mine, 1 molybdenite mine, 3 metallurgical plants, 1 soapstone quarry, 2 natural abrasive plants, 1 graphite mine, 3 magnesite mines, 3 mineral water plants, 1 phosphate mine, 1 pyrites mine and 3 cement plants in 1928.

Table 41.—Employees, Salaries and Wages in the Mineral Industry of Quebec, 1927 and 1928

Industry	†Average number of employees				Salaries and wages			
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female		\$	\$	\$
1927								
Copper-gold	190	10	1,437		1,637	231,734	1,268,043	1,499,777
Silver-lead-zinc	18		296		314	33,430	290,389	323,819
Asbestos	129	12	2,835		2,976	349,434	3,411,758	3,761,192
Feldspar	4		120		124	8,430	66,841	75,271
Iron oxides	3		45		48	3,750	34,930	38,680
Mica	3	1	107		111	4,920	68,122	73,042
Quartz	6	1	78		85	7,800	77,228	85,028
Clay products	71	7	1,001		1,079	149,938	918,480	1,068,418
Cement	46	6	859		911	107,791	1,138,863	1,246,654
Lime	18		262		280	32,415	227,582	259,997
Sand and gravel	30	5	4,817		4,852	55,773	695,040	750,813
Stone	115	5	2,969		3,089	200,509	2,564,970	2,765,479
*All other industries	187	23	2,292	4	2,506	398,288	2,758,014	3,156,302
Total	820	70	17,118	4	18,012	1,584,212	13,520,260	15,104,472
1928								
Auriferous quartz	26	6	161		193	47,357	295,565	342,922
Copper-gold	228	17	1,772		2,017	378,423	1,907,663	2,286,086
Silver-lead-zinc	13		244		257	28,685	265,657	294,342
Asbestos	128	19	3,023		3,170	372,070	3,617,574	3,989,644
Feldspar	5		115		120	9,232	58,512	67,744
Iron oxides	3		42		45	4,074	34,760	38,834
Mica	2	1	54		57	3,330	24,165	27,495
Quartz	6	2	57		65	11,760	56,468	68,228
Clay products	73	8	1,140		1,221	153,694	1,003,243	1,156,937
Lime	22		297		319	37,810	272,220	310,030
Sand and gravel	8	2	4,635		4,645	17,902	657,122	675,024
Stone	117	9	2,690		2,816	241,480	2,215,272	2,456,752
*All other industries	210	33	2,756	10	3,009	474,446	3,733,260	4,207,706
Total	841	97	16,986	10	17,934	1,780,263	14,141,481	15,921,744

*See footnote to Table 40.

†See note page 31.

ONTARIO

The province of Ontario may be described as the central province of the Dominion; Hudson bay and James bay are on the north, the St. Lawrence river and the Great Lakes constitute the greater part of the southern boundary, the province of Quebec lies immediately to the east, and Manitoba adjoins Ontario on the west. Traversing the province in easterly and westerly directions, the main lines of the Canadian National and Canadian Pacific Railways, with their many branch lines provide an extensive system of transportation. The main line of the Canadian Pacific Railway from Montreal to Winnipeg crosses the rich Sudbury section in a westerly direction, then runs along the north shore of lake Superior and through the Lake-of-the-Woods district. In the vicinity of Sudbury are the famous nickel-copper properties which supply the greater part of the world's nickel. The Temiskaming and Northern Ontario Railway connects North Bay and Cochrane and runs through the rich silver camps of the Cobalt and South Lorrain areas and has branch lines extending to other silver camps and to the gold camps of Kirkland lake and Porcupine.

Mining was carried on in Ontario as far back as 1770, when copper was recovered from mines on the shores of lake Superior. Thus, although very little mining of any consequence was done until recent years, this province early took its place in the mining history of Canada. About the year 1800, the first iron furnace in the province was erected in Leeds county, and a few years later a blast furnace for the smelting of bog ores was built at Normandale in Norfolk county. This initial effort proved a failure but later another attempt was made and smelting was carried on, as a successful enterprise until 1847. Other iron furnaces were established in different parts of this older section of Ontario, but their operations were never very successful. In 1899 the Algoma Steel Corporation of Sault Ste. Marie opened the Helen mine on the northeast shore of lake Superior, and other iron properties, namely the Magpie mine and the Moose Mountain mine, have also been operated by this company. At the present time there is practically no production of iron ore in Ontario, the steel companies finding it more economical to bring in ore from the United States.

Construction of the Canadian Pacific Railway in 1883 led to the discovery of the rich nickel-copper ores in the Sudbury district. Fortunately, about this time also it was found that the addition of nickel in the manufacture of steel armour plate made the plate much stronger and harder and therefore more useful. For some years after the opening up of the Sudbury area, one of the larger properties was operated as a copper mine, the nickel in the ore not being detected until about 1887. About 90 per cent of the world's output of nickel comes from the Sudbury area. The deposits there are very great. These ores also carry precious metals such as gold, silver, platinum, palladium, rhodium, and other related metals.

Ontario has the distinction of having had the first producing oil well on the American continent. This well was dug at Oil Springs in Lambton county in the year 1858, and from that time forward, oil wells have been discovered in other sections of that part of Ontario. However no large oil fields have been found since 1905, and consequently the annual production has been steadily declining despite the additional production of a few small new fields.

As far back as 1866 gold was discovered in a spectacular occurrence at the Richardson property, Hastings county, and that district was the scene of a small gold rush at that time. Other properties in the same vicinity were worked intermittently, but at the present time no gold is being recovered from that area. Other finds were made from time to time in various parts of the province, and in 1899 Ontario reported a production of the yellow metal valued at \$421,591.

Five years after this, the Temiskaming and Northern Ontario Railway was projected and built from North Bay in a northerly direction. This opened up a country of which, hitherto, little had been known, and fortunately, passed right through the now famous Cobalt area, which was thus discovered in 1903. The finding of such a rich silver deposit led to intense prospecting on either side of the railway; the silver camps of Gowganda, Elk Lake and South Lorrain and the rich gold areas of Porcupine and Kirkland lake are the present outcome of these early endeavours.

Although the production of silver has fallen off to some extent in late years, intensive prospecting underground had resulted in the finding of blind veins in some of the older properties; these have helped to maintain the silver output. Gold production on the other hand has grown

apace. Some companies with proven ore bodies have augmented their milling facilities, and increased their outputs. Through intensive underground exploration many others are changing prospects into mines.

Mention may here be made of the Silver Islet mine on an extremely small island off Thunder cape in lake Superior which was worked for fifteen years or more and which produced in the neighbourhood of \$3,500,000 worth of silver. This property was extremely rich, but was at one time flooded with water, and any attempt to work it since has met with very little success; diamond drilling has disclosed nothing of value at depth.

Lead is known to occur in different sections of Ontario, but until recent years, little production was reported. In 1915, however, the Kingdon Mining, Smelting and Manufacturing Company Limited, opened up a property near Galetta in Carleton county, and this property has been producing steadily since that time.

Ontario mineral deposits include a large number of non-metallic minerals of economic value. The largest mica mine in Canada is located near Sydenham in Frontenac county, and this county also supplies the greater part of the feldspar produced in the province. Talc is mined in the vicinity of Madoc in Hastings county. The salt-producing sections of the province are in the southwestern part. No rock salt is mined, the entire output coming from brine pumped from wells; the development of the salt industry dates back to 1865 when the first well was sunk at Goderich in Huron county in a search for oil.

Natural gas was discovered in Ontario in December, 1888, in Essex county near the present town of Leamington, and in the following year a well was opened up in Welland county about 25 miles west of Niagara Falls. At that time there was little market in Canada for natural gas, so the gas from these wells was piped to the neighbouring cities of Detroit, Toledo and Buffalo. Some of the older wells are now becoming depleted, but new wells are brought in from time to time. The natural gas supply, however, is now being conserved under government supervision so that the most economic use may be made of the available supply.

The clay products and construction materials industries have grown with the increasing demand for such commodities. Portland cement is manufactured in various sections of the province where suitable limestone and clay have been found at convenient distances from the large markets for this class of material. The quarrying of high quality building stone is an important industry throughout the province, stone of various kinds being produced in large quantities. The quarry operated by the Queenston Quarry Co. is reported to be the largest in Canada. It produces a fine dolomitic limestone used extensively for buildings. Hydrated lime and quicklime are also being manufactured and the growth of the brick industry has been rapid. The construction of highways and the building of concrete structures have enlarged the demand for gravel and crushed stone. These apparently common materials form a very large part of the non-metallic mineral production of the province.

Table 42.—Mineral Production of *Ontario, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Antimony..... lb.	1,596	281				
Arsenic (Ass Os)..... lb.	4,055,477	135,549	4,961,178	197,668	4,097,226	178,149
Bismuth..... lb.	6,440	6,440	2,072	1,003	14,002	5,067
Cobalt..... lb.	664,778	1,136,014	880,590	1,764,534	954,860	1,671,900
Copper..... lb.	41,312,867	4,828,964	45,341,295	4,946,533	66,607,510	8,770,149
Gold..... fine oz.	1,497,215	30,950,180	1,627,050	33,634,108	1,578,434	32,629,126
Iron pig from Canadian ore..... tons						
Lead..... lb.	7,398,795	580,730	7,990,709	528,729	6,814,757	402,289
Nickel..... lb.	65,714,294	14,374,163	66,798,717	15,262,171	96,755,578	22,318,907
Palladium..... fine oz.	10,024	640,178	11,545	554,190	13,087	605,563
Platinum..... fine cz.	9,471	919,349	11,217	716,653	10,452	704,360
Silver..... fine oz.	9,274,962	5,760,402	9,307,953	5,246,893	7,242,601	4,213,456
Zinc..... lb.					58,724	3,226
NON-METALLICS—						
Actinolite..... tons	80	1,000	86	1,075	70	875
Asbestos..... tons	14	3,935				
1 eldspar..... tons	22,783	199,102	17,119	154,533	18,954	180,153
Fluorspar..... tons						
Garnets..... tons						
Graphite..... tons	2,401	165,344	1,795	109,613	1,047	52,373
Grinding pebbles..... tons	64	576				
Gypsum..... tons	89,987	496,059	83,998	500,688	85,811	553,271
Mica..... tons	881	59,086	1,284	75,183	2,559	32,944
Mineral water..... Imp.gal.	208,400	27,277	293,200	12,811	253,630	27,890
Natural gas..... M cu. ft.	7,764,996	4,409,593	7,311,215	4,331,780	7,632,800	4,535,312
Peat..... tons					1,497	5,845
Petroleum..... brl.	137,850	379,221	139,606	288,347	134,094	249,737
Phosphate..... tons			82	824		
Pyrites..... tons	371	4,912	463	6,077	14,974	54,100
Quartz..... tons	192,733	339,304	159,150	266,204	194,503	308,608
Salt..... tons	252,345	1,388,672	254,181	1,510,777	279,841	1,377,629
Silica brick..... M	1,307	66,241	553	28,549	1,597	86,323
Talc and soapstone..... tons	14,882	178,986	15,138	181,981	14,925	179,187
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	3,398,860	4,792,857	3,751,786	5,144,326	3,911,795	5,520,897
Clay products.....		5,356,469		5,853,035		6,177,664
Lime—						
Quicklime..... tons	189,079	1,593,468	198,383	1,657,552	228,101	1,870,476
Hydrated..... tons	39,217	457,978	44,749	540,687	49,085	597,367
Sand and gravel..... tons	6,483,163	2,292,678	7,512,763	2,405,729	10,389,408	2,230,307
Stone..... tons	3,622,042	3,157,288	4,254,960	4,060,709	4,581,929	4,041,568
Total.....		84,702,296		89,982,962		99,584,718

*The total production of blast-furnace pig-iron in Ontario in 1926 was 507,079 long tons valued at \$11,166,738; in 1927 it was 406,148 long tons valued at \$9,202,960; and in 1928 it was 734,971 long tons valued at \$14,427,481.

† Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

Table 43.—Net Income from the Sales of Products from the Mineral Industry of Ontario, 1927 and 1928 (Quantities shown are final shipments during the year; except as noted, values given are those reported as received, f.o.b. shipping point.

Industry and Product	1927		1928	
	Quantity	Value	Quantity	Value
		\$		\$
GOLD MINING INDUSTRY—				
Crude bullion..... fine oz.	2,167,293	33,621,783	1,967,217	32,589,247
Concentrates, slags, etc..... tons	824	94,852	199	44,139
Total for gold mining industry.....		33,716,635		32,633,386
NICKEL-COPPER INDUSTRY—				
Nickel-Copper Mining—				
Ores (estimated value)..... tons	1,305,917	5,223,668	1,457,910	5,831,640
Nickel-Copper Metallurgical Works—				
Smelter and refinery sales less the estimated cost of ores treated..		16,193,222		26,587,543
(Products: Matte exported, and sales of refined nickel, converter copper, nickel oxide, gold, silver and metals of the platinum group).				
Total for nickel-copper industry.....		21,416,890		32,419,183
SILVER-COBALT INDUSTRY—				
Silver Cobalt Mining				
Silver bullion..... fine oz.	2,040,070	1,151,544	1,815,661	1,055,485
Ores, concentrates and residues—				
(a) Shipped to Canadian smelters..... tons	3,763	3,175,496	3,300	2,438,731
(b) Exported..... tons	2,714	433,506	2,825	444,668
Silver-Cobalt Metallurgical Works—				
Smelter and refinery sales less the estimated cost of ores, etc., treated.....		1,414,424		1,680,423
(Products: Silver bullion, arsenic, nickel and cobalt (in the form of metal, oxides and salts), speiss residues, and silver-lead-bismuth bullion).				
Total for silver-cobalt industry.....		6,174,970		5,619,307
SILVER, LEAD, ZINC INDUSTRY AND COPPER-GOLD MINING INDUSTRY—				
Ores and concentrates..... tons	3,992	399,238	5,787	297,188
Lead Metallurgical Works—				
Pig lead sales (less the estimated cost of ores treated). ... pounds		129,179		128,673
Total for lead, zinc and copper-gold industries.....		528,417		425,861
Total—				
(a) Metal mining and metallurgical works listed above.....		61,836,912		71,097,737
(b) Non-Metal mining industries, including fuels.....		7,325,692		7,467,562
(c) Structural materials and clay products industries.....		19,662,038		20,438,279
Grand total.....		88,824,642		99,003,578

Table 44.—Number of Plants and Capital Employed in the Mineral Industry of Ontario by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Auriferous quartz	46	65,613,387	1,876,241	26,848,329	94,337,957	68	92,559,134	2,003,965	28,528,944	123,092,043
Copper-gold	.....	.....	.....	.....	.....	5	1,022,461	16,543	3,798,583	4,837,587
Nickel-copper	.....	.....	.....	.....	.....	.....	845,106,028	485,011	68,665	45,659,704
Silver-cobalt	26	23,815,697	1,024,241	5,283,707	30,123,645	19	16,765,120	930,891	4,331,672	22,027,683
Silver-lead-zinc	4	3,012,320	295,303	393,837	3,701,460	6	4,701,986	175,412	405,505	5,282,903
Metallurgical works	5	19,488,993	7,982,254	6,124,889	33,596,136	5	21,749,451	5,862,632	6,533,564	34,145,647
Feldspar	12	102,607	12,471	724	115,802	8	77,808	6,335	6,646	90,789
Mica	8	22,842	4,160	17,296	44,298	9	27,842	10,160	17,296	55,298
Natural gas	2,181	26,930,822	646,361	5,344,667	32,921,850	1,958	31,064,794	620,221	5,186,892	36,871,903
Petroleum	2,669	2,046,056	23,753	20,981	2,090,790	2,643	1,958,936	23,866	29,181	2,011,927
Quartz	8	385,356	84,639	500	470,495	5	394,065	37,782	.....	431,847
Salt	9	1,608,790	300,345	369,524	2,278,659	9	3,079,339	220,439	367,078	3,666,856
Talc and soapstone	4	611,120	26,126	32,351	669,597	3	555,920	25,242	43,920	625,082
Clay products	131	11,164,549	1,398,446	1,438,325	14,051,320	122	11,417,193	1,510,741	1,507,104	14,435,038
Lime	29	1,763,605	238,529	225,265	2,227,399	25	2,177,855	240,340	244,043	2,662,238
Sand and gravel	350	4,061,806	42,742	441,919	4,546,467	372	4,180,122	66,997	252,415	4,499,534
Stone	86	5,774,455	237,235	560,842	6,622,532	106	6,866,465	403,907	654,433	7,924,805
All other mines	24	51,416,777	1,487,573	1,502,491	54,406,841	19	12,727,860	1,573,103	3,223,109	17,524,072
Total	5,592	217,819,182	15,730,419	48,655,647	282,205,248	5,390	256,432,379	14,213,527	155,199,050	325,844,956

† Includes data for 6 nickel-copper mines, 2 gypsum quarries, 4 cement plants, 1 actinolite mine, 1 graphite mine, 7 mineral water plants, 1 phosphate plant, 1 pyrites mine and 1 silica brick plant in 1927, and for 4 cement plants, 2 gypsum quarries, 1 actinolite mine, 1 graphite mine, 2 pyrites mines, 1 sulphur plant, 6 mineral water plants, 1 silica brick plant and 1 peat bog in 1928.

Table 45.—Employees, Salaries and Wages in the Mineral Industry of Ontario 1927 and 1928

Industry	†Average number of employees				Salaries and wages			
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female		\$	\$	\$
1927								
Auriferous quartz	394	27	6,625	5	7,051	1,238,776	10,286,691	11,525,467
Copper-gold	105	4	1,349	.....	1,458	285,498	1,892,665	2,178,163
Silver-cobalt	48	1	409	.....	458	64,426	594,993	659,419
Silver-lead-zinc	168	15	2,087	1	2,271	537,987	2,919,277	3,457,274
Metallurgical works	3	.....	107	.....	110	3,213	73,069	76,282
Feldspar	2	.....	43	.....	47	6,486	28,335	34,824
Mica	2	2	.....	.....	.....	.....	.....	.....
Natural gas	292	95	636	.....	1,023	472,200	598,328	1,070,528
Petroleum	23	.....	113	.....	136	24,682	90,516	115,198
Quartz	7	.....	103	.....	110	9,657	90,232	99,889
Salt	37	12	289	.....	338	111,980	322,549	434,529
Talc and soapstone	5	2	58	.....	65	10,698	51,834	62,532
Clay products	161	28	2,315	.....	2,504	398,917	2,129,687	2,528,604
Lime	34	10	410	.....	454	82,005	422,097	504,102
Sand and gravel	51	6	849	.....	906	118,975	671,923	790,898
Stone	65	17	1,396	.....	1,478	160,571	1,143,385	1,303,956
*All other mines	83	5	2,650	.....	2,738	198,147	3,713,359	3,911,506
Total	1,478	224	19,439	6	21,147	3,724,221	25,028,940	28,753,161
1928								
Auriferous quartz	457	35	7,441	1	7,934	1,391,936	11,322,952	12,714,888
Copper-gold	15	6	107	.....	138	44,361	123,820	168,184
Nickel-copper	43	1	1,919	.....	1,963	142,299	2,994,589	3,136,888
Silver-cobalt	90	4	1,072	.....	1,166	246,284	1,563,182	1,809,466
Silver-lead-zinc	44	4	563	.....	611	118,958	505,380	624,338
Metallurgical works	164	16	2,349	1	2,539	545,111	3,445,350	3,990,461
Feldspar	2	1	100	.....	103	4,940	71,976	76,916
Mica	2	1	34	.....	37	3,150	11,514	14,664
Natural gas	317	112	859	.....	1,288	571,414	928,163	1,499,577
Petroleum	15	2	114	.....	131	13,720	95,145	108,865
Quartz	7	.....	104	.....	111	11,763	93,540	105,303
Salt	39	14	299	.....	352	97,756	337,214	434,970
Talc and soapstone	3	2	43	.....	48	9,585	44,858	54,443
Clay products	168	32	2,261	.....	2,461	437,193	2,204,257	2,641,450
Lime	32	9	443	.....	481	81,830	468,422	550,252
Sand and gravel	50	10	1,295	.....	1,355	127,089	863,525	990,614
Stone	74	15	1,581	.....	1,670	190,223	1,356,414	1,546,637
†All other mines	57	6	1,063	.....	1,126	128,243	1,316,014	1,444,257
Total	1,589	270	21,647	2	23,508	4,165,808	27,746,315	31,912,123

*See footnote to Table 44.

†See note page 31.

MANITOBA

Until recently, Manitoba was looked upon as a grain-growing province only and such work as was done on the mineral resources of the province was confined mainly to the non-metallic minerals. The earliest mineral industry was the extraction of salt from the brine springs on the west side of lake Manitoba and lake Winnipegosis by freedmen from the Hudson's Bay Company service. As Winnipeg grew, demand became greater for building stone and the Tyndall limestone of the province is now used in the construction of many imposing Canadian buildings. Gypsum deposits were opened up northwest of lake St. Martin in the late nineties and have been in continuous operation since that time. Brick-making was carried on in several towns as the demand grew and Portland cement manufacture was established at Fort Whyte.

Prospecting for metalliferous deposits and the establishment of metal mining are more recent developments. In the northwest section of the province, the Flin Flon and Sherritt-Gordon mines, large copper-zinc deposits, have been located. Experimental work is now being carried on in the treatment of the ore from the Flin Flon. Gold has been found in several areas east of lake Winnipeg and important mining companies are engaged in developing prospects in this field.

Manitoba is now regarded as having great possibilities as a mineral-producing province; more than three-fifths of its total area is underlain by Precambrian formations similar to those found so richly mineralized in the neighbouring province of Ontario.

Table 46.—Mineral Production of Manitoba, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Gold..... fine oz.	188	3,886	182	3,762	19,813	409,571
Silver..... fine oz.	18	11	12	7	1,763	1,026
NON-METALLICS—						
Gypsum..... tons	35,172	461,461	39,895	512,008	51,285	609,039
Natural gas..... M cu. ft.	200	60	200	60	200	60
Quartz, (Rose quartz)..... tons					1	360
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	612,155	1,572,401	551,698	1,378,121	693,450	1,685,084
Clay products.....		248,497		201,464		291,791
Lime..... tons	23,988	251,269	22,714	246,279	28,337	319,699
Sand and gravel..... tons	989,581	178,059	1,333,580	228,655	1,653,929	262,006
Stone..... tons	101,571	357,884	154,666	318,556	235,864	608,217
Total.....		3,073,528		2,888,912		4,186,853

Table 47.—Number of Plants and Capital Employed in the Mineral Industry of Manitoba by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Copper-gold-silver.....	3	487,043	36,971		524,014	7	2,110,899	194,147	18,461	2,323,507
Clay products....	4	85,865	90,257	41,337	217,459	5	166,670	58,610	120,958	346,238
Lime.....	4	466,544	30,879	8,326	505,749	4	487,061	46,046	3,230	536,337
Sand and gravel..	10	292,549	7,200	82,108	381,857	10	314,051	24,262	124,590	462,903
Stone.....	6	292,396	33,709	163,818	489,923	7	373,531	78,315	88,577	540,423
† All other mines.	6	8,155,689	409,605	1,095,824	9,661,118	8	9,270,312	522,853	1,752,601	11,545,766
Total....	33	9,780,086	608,621	1,391,413	11,780,120	41	12,722,524	924,233	2,108,417	15,755,174

† Includes data for 1 auriferous quartz mine, 1 gypsum quarry, 2 cement plants and 2 natural gas wells in 1927; and for 2 auriferous quartz mines, 1 cement plant, 1 gypsum quarry, 1 rose quartz deposit and 3 natural gas wells in 1928.

Table 48.—Employees, Salaries and Wages in the Mineral Industry of Manitoba, 1927 and 1928

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1927						\$	\$	\$
Copper-gold-silver.....	16		70		86	43,118	177,947	221,065
Clay products.....	9	2	93		104	19,350	91,536	110,886
Lime.....	8		113		121	14,166	69,194	83,360
Sand and gravel.....	9		228		237	15,970	89,760	105,739
Stone.....	6	1	148		155	16,554	168,556	185,110
*All other mines.....	29	2	273		304	90,158	436,487	526,645
Total.....	77	5	925		1,007	199,316	1,033,489	1,232,805
1928								
Copper-gold-silver.....	35	7	243		285	68,126	407,342	475,468
Clay products.....	10	2	265		277	26,090	117,688	143,778
Lime.....	7		112		119	12,968	82,684	95,652
Sand and gravel.....	8		275		283	14,560	101,413	115,973
Stone.....	13	1	257		271	35,863	359,853	395,716
*All other mines.....	31	7	352		390	98,089	601,588	699,677
Total.....	104	17	1,504		1,625	255,696	1,670,568	1,926,264

*See footnote to Table 47.

†See note page 31.

SASKATCHEWAN

Saskatchewan, the great grain-growing province of the Dominion, lies between Alberta and Manitoba. While the greatest development in this province so far has been in agriculture, there is each year an appreciable production of lignite coal, clays and clay products, sand and gravel, sodium sulphate, and occasionally other mineral products. Large clay deposits both of fireclay and of clay suitable for the manufacture of pottery, occur south of Moose Jaw and the economic development of these deposits on a great scale is only a matter of time. Large areas of unprospected territory in the northern part of the province are known to be underlain by the same Precambrian rocks that have proved mineral-bearing in other parts of Canada. In this territory, lode gold has been reported near Beaver lake, and iron and other metallic minerals near lake Athabasca. In connection with the sodium sulphate deposits, it may be noted that these occur as lakes which are solid at certain seasons, and mushy or even liquid at other times. Investigations have been carried on for several years by the *Mines Branch* at Ottawa to determine the commercial possibilities of these areas. Available tonnage has been blocked out and some deposits have been worked successfully. Shipments of sodium sulphate from Saskatchewan have reached Ontario points and the use of the natural sulphate has partially replaced the manufactured product in some fields. Development of the lignite deposits has progressed to a greater extent in Saskatchewan than the production of any other mineral in that area. Most of the mines are operated on a small scale, largely to meet the needs of the surrounding country, and many of them are worked only in the winter months, as the owners find it more profitable to grow wheat than to mine coal during the summer season.

Table 49.—Mineral Production of Saskatchewan, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
Non-METALLICS—		\$		\$		\$
Coal..... tons	439,803	819,805	470,216	868,867	471,713	831,491
Sodium sulphate..... tons	6,755	13,550	5,659	11,319	6,016	68,804
Volcanic dust..... tons	90	630	105	735	485	9,795
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		214,113		311,204		377,896
Sand and gravel..... tons	863,901	145,296	1,517,801	263,100	2,225,524	431,475
Total.....		1,193,394		1,455,225		1,719,461

Table 50.—Number of Plants and Capital Employed in the Mineral Industry of Saskatchewan by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Num- ber of plants	Cost of lands, buildings, ma- chinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Num- ber of plants	Cost of lands, buildings, ma- chinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Coal.....	55	3,600,898	46,940	141,233	3,789,071	58	3,746,791	61,512	162,999	3,971,302
Clay products..	6	604,681	67,458	54,831	726,970	5	873,246	76,443	80,426	1,030,115
Sand and gravel..	5	54,750	2,000	.....	56,750	53	80,000	3,000	.....	83,000
†All other mines	6	428,000	31,199	57,417	516,616	8	550,000	13,000	.....	563,000
Total.....	72	4,688,332	147,597	253,481	5,089,410	124	5,250,037	153,955	243,425	5,647,417

†Includes data for 1 sodium sulphate plant, 2 natural abrasives plants, and 3 petroleum wells in 1927; and for 3 sodium sulphate plants, 3 petroleum wells and 2 natural abrasives plants in 1928.

Table 51.—Employees, Salaries and Wages in the Mineral Industry of Saskatchewan, 1927 and 1928

Industry	†Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1927					\$	\$	\$
Coal.....	34	2	509	545	71,060	482,022	553,082
Clay products.....	13		141	154	26,477	100,820	127,297
Sand and gravel.....	4		351	355	4,000	107,476	111,476
*All other mines.....	2	1	55	58	4,800	59,049	63,849
Total.....	53	3	1,056	1,112	106,337	749,367	855,704
1928							
Coal.....	29	3	509	541	68,374	473,520	541,894
Clay products.....	13		140	153	28,834	131,222	160,056
Sand and gravel.....	4		473	477	7,000	148,898	155,898
*All other mines.....	3	1	54	58	8,500	75,802	84,302
Total.....	49	4	1,176	1,229	112,708	829,442	942,150

*See footnote to Table 50.

†See note page 31.

ALBERTA

The province of Alberta lies immediately east of British Columbia, the summit of the Rocky mountains marking its western boundary as far north as 54°, north latitude. From that point, northerly, the line follows the 120th meridian to Mackenzie district. Alberta is yet for the most part, a grazing and wheat-growing country, but the coal mines which are located in the area immediately to the east of the mountains, contribute largely to the mineral production of Canada. Natural gas is also of considerable importance in Alberta as a fuel for domestic and industrial purposes. Prospecting for oil has been carried on in many fields and considerable success has been attained. Gold is also known to occur in the gravels underlying some of the rivers.

As in Ontario, where the opening of mining areas followed the building of railroads, so also the construction of the Canadian Pacific Railway and the Canadian National Railway through the mountain led to the exploitation of the coal areas in Alberta. The famous Crowsnest pass, through which the southerly branch of the Canadian Pacific Railway transcontinental line runs, has coal within easy access from the railroad. Along the main line of the same railway which enters the mountains near Calgary and Banff, a large amount of work has also been done in the vicinity of Bankhead, and quantities of semi-anthracite coal have been produced, but these workings are closed down at the present time. The Canadian National Railway running west from Edmonton passes through coal areas for a considerable distance.

Deposits of bituminous sands in the northern part of the province along the Athabasca river have become of economic importance in recent years. Experimental work is being carried on by the *University of Alberta* at Edmonton, and by officials of the *Mines Department* at Ottawa, to promote the utilization of these sands.

Table 52.—Mineral Production of Alberta, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Gold.....fine oz.			42	868	68	1,406
Silver.....fine oz.			4	3	7	4
NON-METALLICS—						
Bituminous sands..... tons	528	2,112	2,706	10,824	94	374
Coal..... tons	6,503,705	20,886,103	6,934,162	21,982,058	7,336,330	23,532,414
Natural gas.....M cu. ft.	10,794,697	3,019,221	13,434,621	3,586,533	14,288,605	3,754,466
Petroleum..... brl.	216,050	902,504	318,741	1,185,948	482,047	1,764,172
Salt..... tons	2,037	22,696	100	1,300		
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	423,766	873,621	601,699	1,303,880	834,067	1,732,582
Clay products.....		804,933		889,358		1,162,264
Lime..... tons	3,790	39,517	4,570	46,947	6,672	69,588
Sand and gravel..... tons	1,754,965	412,430	1,392,752	293,674	2,575,708	489,406
Stone..... tons	3,759	13,890	3,367	7,830	5,010	24,740
Total.....		26,977,027		29,309,222		32,531,416

Table 53.—Number of Plants and Capital Employed in the Mineral Industry of Alberta by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by				Total	Capital employed as represented by				Total
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable		Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	
		\$	\$	\$	\$		\$	\$	\$	\$
Coal.....	292	46,611,981	1,072,809	7,759,852	55,444,642	279	47,006,422	1,113,144	8,218,333	56,337,899
Natural gas.....	86	21,175,361	213,521	2,195,359	23,584,241	84	22,330,394	270,555	2,329,528	24,930,477
Petroleum.....	45	15,193,332	929,954	4,302,394	20,425,680	92	22,274,176	1,214,735	5,422,518	28,911,429
Clay products.....	10	1,526,693	298,665	454,067	2,279,425	11	2,005,553	339,726	525,214	2,870,493
Sand and gravel..	18	324,200	800	2,000	327,000	14	323,000	4,800	2,000	329,800
Stone.....						4	4,000			4,000
†All other mines..	10	2,652,483	285,024	205,019	3,142,526	6	3,680,154	568,393	924,333	5,172,880
Total		461,874,484,050	2,800,773	14,918,691	105,203,514	490	97,623,699	3,511,353	17,421,926	118,556,978

†Includes data for 1 salt well, 3 bituminous sands plants, 2 cement plants, 2 lime plants and 2 stone quarries in 1927; and for 2 cement plants, 2 lime plants, and 2 bituminous sands plants in 1928.

Table 54.—Employees, Salaries and Wages in the Mineral Industry of Alberta, 1927 and 1928

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1927						\$	\$	\$
Coal.....	549	32	8,932		9,513	1,371,969	12,166,597	13,538,566
Natural gas.....	73	18	206		297	174,947	251,179	426,126
Petroleum.....	63	22	539		624	146,277	836,620	982,897
Clay products.....	24	6	322		352	62,211	319,988	382,199
Sand and gravel.....	2		222		224	3,780	83,155	86,935
*All other mines.....	15	2	178		195	26,000	256,581	282,581
Total	726	80	10,399		11,205	1,785,184	13,914,120	15,699,304
1928								
Coal.....	610	35	9,280		9,925	1,554,701	13,089,846	14,644,547
Natural gas.....	88	22	241		351	229,500	335,991	565,491
Petroleum.....	63	13	882		958	141,380	1,628,715	1,770,095
Clay prod. cts.....	26	3	445		474	68,941	443,324	512,265
Sand and gravel.....	1		386		387	1,700	177,412	179,112
Stone.....			9		9		7,500	7,500
*All other mines.....	23	2	229		254	40,710	302,317	343,027
Total	811	75	11,472		12,358	2,036,932	15,955,105	18,022,037

*See footnote to Table 53.

†See note on page 31.

BRITISH COLUMBIA

British Columbia, Canada's mountain province, has been associated with mining for many years. It is a province of mountains and valleys, swift running rivers and wide fertile tracts between the main ranges. It has an area of 355,855 square miles in extent, of which 353,416 square miles are land and 2,439 square miles are covered with water.

Broadly speaking there are three mountain systems, the Coast range, on the west, the Columbia system which includes the Cariboo, Selkirk and Purcell ranges in the centre and the Rocky Mountains on the east, the summit of the latter forming the provincial boundary of Alberta and British Columbia as far north as latitude 54°.

In the southerly sections of the province the main rivers are the Fraser, the Columbia and their tributaries, while farther north, the Skeena, the Stikene and the Nass and their tributaries empty into the Pacific ocean. The Peace river, which has its headwaters in the northeastern section, flows in a southeasterly direction and then north to Great Slave lake in Mackenzie district after which it joins the Mackenzie river by way of the Liard, and thence reaches salt water at the Arctic ocean.

Transportation which did so much to open up the southern section of the province when the Canadian Pacific Railway was built, has been greatly augmented in recent years by the construction of the Canadian National Railway to Prince Rupert, the Pacific Great Eastern from Squamish to Prince George, and the Canadian National down through the central sections of the province to tide-water at Vancouver.

In the year 1825 David Douglas, botanist, discovered galena on the eastern shore of Kootenay lake at what is now the Blue Bell mine. Ten years later, coal was found by Dr. W. F. Tolmie, at Fort Rupert, Vancouver Island, and in 1850 the existence of coal at Nanaimo was established by a Mr. J. W. McKay. This deposit was worked by the Hudson's Bay Company under the name of the Nanaimo Coal Company and shipments were made chiefly to San Francisco, California. The first discovery of gold was made at Gold Harbour on the west coast of the Queen Charlotte Islands about the year 1852 and during the same year, gold was found in the Similkameen country. A few years later or between 1855 and 1857 discoveries of gold were made on the Thompson, Fraser and Columbia rivers which precipitated the great Cariboo gold rush of 1858.

In 1861 gold was found on the Lightning and Williams Creeks and in the following year most of the other rich creeks in the Cariboo became known. Williams creek has yielded more gold than any other stream in British Columbia.

As soon as the easily-won gold began to show signs of depletion from the creek bottoms, mining men commenced to prospect for minerals in place and the first recorded production of copper was made in 1888-1889 from the Hall mines near Nelson and this was followed in 1891 by a small shipment of copper ore from Rossland. Other discoveries followed in the Boundary country, in the Slocan, on the coast, and in East Kootenay. Today, British Columbia has in the Sullivan mine the largest lead-zinc mine in the British Empire, leads all other provinces in copper and silver production and stands second in gold.

Coal is the province's most important non-metallic mineral. It is found in abundance on the east coast of Vancouver island, in the southwestern portion of the province, and also to a less extent in small detached basins in the northern section of the province. Other non-metallics produced are quartz, pyrites, fluorspar, natro-alunite, pulpstones, sodium carbonate, tale, iron oxides and gypsum.

As arranged, at the time British Columbia joined Confederation, all geological work and mapping is done by the Dominion Government, and parties are sent annually to British Columbia for this purpose. The *Provincial Department of Mines* assists very materially in the opening up and development of prospects and mines. The province is divided into six mining districts, each supervised by a resident engineer, whose duty it is to carry on mineral surveys and to assist prospectors and others with such advice as may be necessary and may come within the scope of a mining engineer's work.

Among the outstanding mines of British Columbia are the Premier mine, a gold and silver property situated at the northerly end of the Portland canal in northern British Columbia, and the Sullivan mine, a rich lead and zinc deposit, at Kimberley in East Kootenay, owned and operated by the Consolidated Mining and Smelting Company of Canada, Limited. Leading copper properties, operated by the Granby Consolidated Mining, Smelting and Power Company of Anyox on the Portland canal in northern British Columbia, and by the Britannia Mining and Smelting Company on Howe Sound, a short distance north of Vancouver, contributed largely to the copper production of the province. Many silver-lead-zinc mines of the Slocan district that have been operated intermittently for a number of years, have been given a new lease of life recently because of the developments in smelter practice at Trail.

The Premier mine was brought to the producing stage and into the dividend class by the *American Smelting and Refining Company, Limited*, who acquired the controlling interest in this mine in the fall of 1919.

The Nickel Plate mine at Hedley in the Similkameen Valley is of interest as it is the only property in the province credited as being a producer of arsenic. The ore from this mine is concentrated and cyanided, the concentrates being shipped to Tacoma for treatment. Gold bullion from this mine is shipped to the Dominion Government Assay Office at Vancouver.

Table 55.—Mineral Production of British Columbia, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Arsenic..... lb.	1,019,200	11,262	1,231,790	13,611	1,334,997	14,903
Cadmium..... lb.					491,894	341,374
Cobalt..... lb.					1,730	420
Copper..... lb.	89,108,017	12,292,450	91,686,297	11,845,870	102,283,210	14,902,664
Gold..... fine oz.	225,866	4,669,065	183,094	3,784,889	196,617	4,064,434
Lead..... lb.	266,812,461	18,012,509	292,770,544	15,388,020	317,722,146	14,537,377
Palladium, Rhodium, etc. fine oz.	50	4,258	11	960	520	22,270
Platinum..... fine oz.					80	4,549
Silver..... fine oz.	10,625,816	6,599,376	11,040,445	6,223,499	10,943,367	6,366,413
Zinc..... lb.	137,033,929	10,154,214	148,806,479	9,186,103	163,530,890	8,983,079
NON-METALLICS—						
Coal..... tons	2,613,719	10,612,915	2,746,243	10,934,777	2,804,594	11,094,353
Diatomite..... tons					160	4,800
Grindstones, pulpstones..... tons	700	45,116	380	27,600	246	20,509
Gypsum..... tons	20,916	156,964	24,493	201,754	20,982	229,843
Iron oxides..... tons	108	920	194	1,350	136	1,815
Natro-alunite..... tons			7	248		
Phosphate..... tons			38	494	550	7,150
Pyrites..... tons	3,374	16,870	37,379	149,516	*32,063	254,872
Quartz..... tons	6,466	77,060	20,859	80,824	16,017	43,876
Sodium carbonate..... tons	595	5,370	805	9,995	519	4,922
Talc..... tons			107	2,620		
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	544,863	1,239,018	523,931	1,182,552	670,796	1,495,204
Clay products.....		592,495		679,788		706,039
Lime—						
Quicklime..... tons	17,606	317,733	16,175	279,230	24,512	345,131
Hydrated..... tons	7,896	99,149	7,936	97,453	10,637	128,865
Sand and gravel..... tons	1,486,254	357,985	1,379,143	342,021	2,334,270	529,669
Stone..... tons	253,061	358,247	256,553	367,996	271,439	391,820
Total.....		65,622,976		60,801,170		64,496,351

*Sulphur content.

Table 56.—Net Income from Sales from the Mineral Industry of British Columbia, 1927 and 1928. (Quantities shown are final shipments during the year: except as noted, values given are those reported as received f.o.b. shipping point.)

	1927		1928	
	Quantity	Value	Quantity	Value
GOLD MINING INDUSTRY—		\$		\$
Auriferous Quartz Mining Industry—Crude bullion..... oz.	23,571	326,314	26,601	334,643
Ore..... tons	96,773	1,880,465	113,818	1,663,073
Concentrates..... tons	27,835	1,459,551	18,930	1,578,691
Slags and residues..... tons			3	2,074
Dry ore and precipitates..... tons				
Total for auriferous quartz mining industry.....		3,666,330		3,578,481
ALLUVIAL GOLD MINING INDUSTRY—				
Bullion sold (gold, silver)..... crude oz.	9,191	152,932	8,424	140,189
Platinum..... fine oz.	21	960	49	2,819
Total for alluvial gold mining industry.....		153,892		143,008
COPPER-GOLD-SILVER MINING INDUSTRY—				
Ore..... tons	329,587	1,644,727	205,773	1,265,687
†Concentrates..... tons	238,653	7,751,340	292,571	10,818,391
Slags and residues..... tons	409	21,711		
Other..... tons	158	13,369		
Total for copper-gold-silver mining industry.....		9,431,147		12,084,078
SILVER-LEAD-ZINC MINING INDUSTRY—				
Lead ore..... tons	66,692	1,515,119	27,130	618,812
Lead concentrates..... tons	192,674	9,513,937	211,024	9,119,639
Zinc ore..... tons	1,861	48,367	70,291	79,653
Zinc concentrates..... tons	181,123	3,603,719	214,698	3,798,096
Dry ore..... tons	10,637	79,278	19,009	148,554
Total for silver-lead-zinc mining industry.....		14,760,420		13,764,754
METALLURGICAL WORKS—				
Smelter and refinery sales, less estimated cost of ores, etc., treated.....		16,391,940		17,615,521
(Products: Gold, silver, refined copper, blister copper, copper sulphate, lead, zinc, cadmium and base bullion.)				
Total:—				
(a) Metal mining and metallurgical works listed above.....		44,403,729		47,185,842
(b) Non-metal mining industries including fuels.....		10,667,060		11,064,676
(c) Clay products and other structural materials.....		2,949,040		3,596,728
Grand total.....		58,019,829		61,847,246

† Includes pyrite concentrates.

Table 57.—Number of Plants and Capital Employed in the Mineral Industry of British Columbia by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Alluvial gold.....	38	1,008,230	55,183	65,646	1,129,059	43	1,748,402	29,390	26,853	1,804,645
Auriferous quartz	16	12,337,471	528,631	927,873	13,793,975	17	14,274,964	270,138	827,273	15,372,375
Copper-gold-silver.....	31	7,620,498	495,548	2,918,683	11,034,729	33	19,822,593	754,896	3,559,810	24,137,299
Silver-lead-zinc.....	146	13,249,200	951,370	4,013,926	18,214,496	123	25,654,196	1,260,823	639,221	27,554,240
Coal.....	35	25,409,332	845,139	2,053,485	28,307,956	34	24,593,123	703,161	2,134,586	27,430,870
Clay products.....	10	895,171	184,543	108,595	1,188,309	12	905,604	187,698	133,873	1,227,175
Lime.....	3	1,102,043	86,227	129,542	1,317,812	4	1,335,840	93,260	149,614	1,578,714
Sand and gravel.....	9	1,047,632	28,518	19,282	1,095,432	16	1,138,825	15,305	18,947	1,174,077
Stone.....	20	591,363	54,480	37,758	683,601	19	628,879	48,667	49,546	727,092
†All other mines and smelters.....	21	26,992,687	7,182,798	3,188,423	37,363,908	18	31,915,063	8,479,774	18,044,209	58,439,046
Total.....	329	90,253,627	10,412,437	13,463,213	114,129,277	319	122,018,489	11,843,112	25,583,932	159,445,533

† Includes data for 2 smelters, 4 gypsum mines, 2 iron oxide mines, 3 quartz quarries, 1 mica mine, 2 talc and soapstone quarries, 1 natro-alunite mine, 1 phosphate plant, 1 iron pyrites mine, 1 cement plant, 1 natural abrasives plant and 2 sodium carbonate properties in 1927; and for 2 metallurgical works, 1 mercury mine, 1 cement plant, 2 iron oxide mines, 3 quartz quarries, 1 talc mine, 3 gypsum quarries, 1 phosphate mine, 2 natural abrasives plants, 1 pyrites mine and 1 sodium carbonate deposit in 1928.

Table 58.—Employees, Salaries and Wages in the Mineral Industry of British Columbia, 1927 and 1928

Industry	†Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1927						\$	\$	\$
Alluvial gold.....	8	1	158	.....	167	15,384	146,233	161,617
Auriferous quartz.....	41	3	578	2	624	136,313	922,700	1,059,013
Copper-gold-silver.....	119	5	2,216	20	2,360	337,451	3,201,802	3,539,253
Silver-lead-zinc.....	144	5	1,990	17	2,156	329,476	3,091,021	3,420,497
Coal.....	239	16	5,038	.....	5,293	630,871	6,910,810	7,541,681
Clay products.....	20	2	296	.....	318	49,563	291,045	340,608
Lime.....	10	3	129	.....	142	18,300	128,995	147,294
Sand and gravel.....	11	1	337	.....	349	27,925	142,628	170,553
Stone.....	10	.....	152	.....	162	23,915	160,447	184,362
*All other mines and smelters	270	27	3,163	.....	3,460	708,039	5,442,030	6,150,069
Total.....	872	63	14,057	39	15,031	2,277,246	29,437,711	31,714,957
1928								
Alluvial gold.....	14	1	184	1	200	23,091	145,121	168,212
Auriferous quartz.....	63	2	623	1	689	150,318	1,025,234	1,175,552
Copper-gold-silver.....	136	7	2,169	25	2,337	353,733	3,480,838	3,834,571
Silver-lead-zinc.....	209	13	2,356	.....	2,578	448,226	3,667,803	4,116,029
Coal.....	257	17	5,043	.....	5,317	661,270	6,928,883	7,590,153
Clay products.....	18	1	315	.....	334	41,874	287,326	329,200
Lime.....	12	4	129	.....	145	28,084	171,316	199,400
Sand and gravel.....	12	.....	403	.....	415	31,494	259,117	290,611
Stone.....	12	.....	159	.....	171	26,305	183,145	209,450
*All other mines and smelters	321	35	3,152	26	3,534	803,169	5,348,615	6,151,784
Total.....	1,054	80	14,533	53	15,720	2,567,564	31,497,398	34,064,962

*See footnote to Table 57.

†See note page 31.

THE YUKON

The Yukon Territory lies in the extreme northwest section of the Dominion of Canada. Immediately to the west is Alaska, and on the east, the Mackenzie district, while the province of British Columbia is adjacent to the greater part of its southern boundary. Alaska was originally owned by Russia, and it comprised that territory lying west of the present Yukon Territory, and a section of the western coast down as far as a long narrow inlet known as the Portland Canal. Russia claimed the north Pacific coast down to latitude 51° N, but in the treaty of 1824 the boundary was fixed at 54° 40' N, and in the following year a treaty was concluded by which Russia relinquished to Great Britain her claim, not only to the region below 54° 40' N, but also to the vast interior occupied by the Hudson's Bay Company up to the frozen ocean. In 1825, the southern and western boundaries of the British possessions were established, but owing to certain ambiguity, the boundary between what are now British Columbia and Alaska, was not very well established. In 1867, Alaska was purchased from Russia by the United States. In the summer of 1896, alluvial gold was found in the Yukon District, and immediately a section of the North American continent which up to this time had been considered of little economic value, became the cause of serious controversy between Canada and the United States because of the doubt as to the proper location of the boundary line of Alaska. Finally, the question was settled in 1903 by the award of the *Alaska Boundary Tribunal*.

Between 1898 and 1905 upwards of \$100,000,000 in gold was taken from the gravels of Bonanza, Eldorado, Hunker, Dominion and Sulphur Creeks and their tributaries. Many of the famous creek claims on Bonanza and Hunker are now being worked by the dredging process, and the terraces of the equally famous White Channel are being washed down by hydraulic methods.

Since 1905, production of gold has gradually decreased; in 1919, the output was valued at about \$1,900,000 and in 1928 at \$710,367. Although there are a great many individual miners, the report of their production is not very extensive and the greater part of the gold is recovered by large hydraulic or dredging companies.

Of late years, the Mayo district on the Stewart river has come into prominence because of the silver-lead ore discovered there. The ore is mined under difficult climatic conditions, and is taken down to the river and piled there ready for transportation to the smelters when navigation opens. Because of the high cost entailed in shipping this ore to the smelter, only high-grade material can be transported economically, and in order to prepare lower grade ore for shipping, the Treadwell Yukon Mining Company, Limited, has constructed a concentrator where custom ore as well as their own is treated.

Other economic minerals such as copper and antimony are known to occur but up to the present time there has been no report of production.

Among the non-metallic minerals, coal is the only one of any importance and it is known to occur in the Yukon in at least eighteen distinct areas. In thirteen of these, coal of economic importance has been discovered. The production, however, has been small, partly because there has been little demand for coal and partly because only very few of the properties are conveniently situated for shipping purposes.

Table 59.—Mineral Production of the Yukon, 1926-1928

Product	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Copper..... lb.					107,377	15,645
Gold..... fine oz.	25,601	529,220	30,935	639,483	34,364	710,367
Lead..... lb.	5,860,373	395,634	4,165,331	218,929	7,191,449	329,045
Silver..... fine oz.	2,095,027	1,301,159	1,647,295	928,580	2,839,633	1,651,985
NON-METALLICS—						
Coal..... tons	316	800	414	2,052	414	2,915
Total.....		2,226,813		1,789,044		2,709,957

Table 60.—Net Income from Sales of Products, from the Mineral Industry of the Yukon, 1927 and 1928 (Quantities shown are final shipments during the year: values given are those reported as received f.o.b. shipping point)

Industry and Product	1927		1928	
	Quantity	Value	Quantity	Value
		\$		\$
ALLUVIAL GOLD MINING INDUSTRY—				
Crude bullion.....crude oz.	38,073	640,141	42,645	709,727
Total for alluvial gold mining industry.....crude oz.	38,073	640,141	42,645	709,727
SILVER-LEAD-ZINC MINING INDUSTRY—				
Lead ore..... tons	1,402	175,816	2,914	543,411
Lead concentrates..... tons	2,686	767,980	3,575	1,016,288
Dry ore..... tons	58	12,752	297	63,000
Total for silver-lead-zinc mining industry..... tons	4,146	956,548	6,786	1,622,699
Total:—				
(a) Metal mining industries listed above.....		1,596,689		2,332,426
(b) Non-metal mining industries.....		2,937		2,890
Total.....		1,598,726		2,335,316

Table 61.—Number of Plants and Capital Employed in the Mineral Industry of the Yukon, by Classes and by Industries, 1927 and 1928

Industry	1927					1928				
	Capital employed as represented by					Capital employed as represented by				
	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Number of plants	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
		\$	\$	\$	\$		\$	\$	\$	\$
Alluvial mines....	53	7,778,121	200,163	546,380	8,524,664	39	7,707,128	273,303	599,499	8,579,930
*Silver-lead and coal mines.....	18	1,573,100	691,609	157,025	2,421,734	14	2,985,769	796,940	343,893	4,126,602
Total.....	76	9,351,221	891,772	703,405	10,946,398	53	10,692,897	1,070,243	943,392	12,706,532

* Includes data for 1 coal mine.

Table 62.—Employees, Salaries and Wages in the Mineral Industry of the Yukon, 1927 and 1928

Industry	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female	Male				
1927					\$	\$	\$
Alluvial mines.....	8	2	144	154	28,811	282,168	310,979
Silver-lead and coal mines.....	9	1	137	147	36,670	343,827	380,497
Total.....	17	3	281	301	65,481	625,995	691,476
1928							
Alluvial mines.....	8	2	132	142	27,745	342,313	370,058
Silver-lead and coal mines.....	13	1	177	191	42,296	395,873	438,169
Total.....	21	3	309	333	70,041	738,186	808,227

*See note page 31

CHAPTER THREE

THE GOLD MINING INDUSTRY IN CANADA

(With tables showing the production of gold)

1. General Review.
2. Review of the Gold Mining Industry in Canada by Areas.
3. The Alluvial Gold Mining Industry.
4. The Auriferous Quartz Mining Industry.
5. The Copper-Gold-Silver Mining Industry.
6. Commodity Statistics—including tables showing production by provinces, imports, exports, and world output of gold.

1. General Review

CANADA

(a) *Definition of the Industry.*—Canada's gold mining industry falls naturally into two main divisions: the winning of placer gold, or the Alluvial Gold Mining Industry, and the recovery of free-milling gold from auriferous quartz mines, described under the title The Auriferous Quartz Mining Industry. In the treatment of ores containing metals other than gold in commercial values, such as copper and silver, gold is often recovered as a by-product; in making up production figures, gold obtained from the treatment of Canadian ores of every kind, is included in the total. Most of the other lode mines producing gold in quantity are included in the group entitled Copper-Gold-Silver Mining Industry.

(b) *Historical.*—During the early history of the industry in Canada (1850-1890), most of the gold produced was obtained from placer deposits in the province of British Columbia. Later, in 1898, the famous Yukon placers were discovered, and for some time these deposits constituted the principal source of Canada's gold. More recently, developments in lode mining, however, have somewhat overshadowed the alluvial workings; as the alluvial yields declined, lode gold recoveries increased until they became the principal source of supply. During the past ten or eleven years the province of Ontario has come to the front as a gold-producer, through the development of the rich gold quartz mines of the Porcupine and Kirkland lake districts; the output from British Columbia mines has been fairly constant for several years; new fields, such as the Rouyn area of Quebec, with its large deposits of gold-bearing copper ore and various sections of northern Manitoba continue to attract the attention of the mining world.

(c) *Sources.*—In 1928 the auriferous quartz mines yielded 88·5 per cent of the total production; alluvial deposits provided 2 per cent; Canadian copper and lead smelters recovered 2·2 per cent; and gold obtained by foreign smelters in the treatment of Canadian ores of various kinds amounted to 7·3 per cent of the total Dominion production of gold.

(d) *Importance of the Industry.*—Among Canada's mineral products, gold holds second place in point of value, being surpassed only by coal. In 1928, gold represented 14·18 per cent of the total value of Canada's mineral output.

Steady progress, too, has been made by Canada as a world producer, and for the past six years, Canada has held third place; the Union of South Africa and the United States continue to hold first and second places, respectively. South Africa production provides more than half the world's output, while Canada produces about seven-eighths as much as the United States, greater than three times as much as Australia, and more than one and one-half times as much as the continent of Asia.

2. Review of the Gold Mining Industry by Areas

NOVA SCOTIA

Gold, obtained mostly from free-milling ores, and partly from gold-bearing ores containing arsenic, continued to be one of Nova Scotia's important items of mineral production from about 1862 until 1903 and during these years many deposits were worked, the annual yields varying from 6,863 fine ounces in 1862 to 30,348 fine ounces in 1902, with an average production of possibly 20,000 ounces each year. In 1904, production dropped to 10,362 ounces, and the output held around this figure until 1910; since then there has been no appreciable revival in production and in 1928 the total output was only 1,290 ounces.

Nova Scotia possesses a large number of small gold lodes in quartzites and slates of Precambrian age. In places these yield very rich ore. They have been worked irregularly during the past sixty years and have made a total production of \$19,023,317. Several of these mines have been recently re-opened. There is renewed interest in the region and further activity may be expected. Hydro-electric power is now available in most parts of the province.

QUEBEC

So far, Quebec has not been a great producer of gold or gold-bearing ores, but recent work in the Rouyn field indicates that this province will become of much more importance as a producer of metals, including gold, than it has ever been in the past. In reviewing the situation in Quebec, the fact that the ores of the Rouyn area are largely copper-gold, with some containing zinc as well, makes it necessary to consider the problem in connection with the production in other provinces from similar ores; this is done in the section on the Copper-Gold-Silver Industry.

Suffice it to say, here, that the increase in production of gold in 1928 from Quebec ores, was due to the smelting of the ores from the Horne mine at the Noranda smelter.

ONTARIO

Ontario, with its rich mines in the Porcupine and Kirkland Lake areas, continued to hold the lead among the gold-producing provinces, contributing 83.49 per cent of the total gold production for Canada in 1928. In the same year Ontario's gold output represented 39.24 per cent of the aggregate value of the mineral production for the province.

Some idea of the phenomenal growth in gold mining in Ontario may be had from the facts that in 1903 the gold output of the province totalled only 9,096 ounces, or 1 per cent of the Canadian aggregate for this metal; in 1913, the output of 219,801 ounces made up 27.4 per cent of Canada's total production; while in 1928, as already noted, Ontario's share at 1,578,434 ounces, represented 83.49 per cent of the total gold produced from Canadian ores.

In 1928, there were in the Porcupine area, nine producing mines of importance, headed by the Hollinger, now one of the world's greatest mines. The others in order of their production values were: Dome, McIntyre, Vipond, Ankerite, Porcupine, Paymaster, Consolidated West Dome Lake, March Gold and Scottish Ontario.

Gold production from the Porcupine area amounted to 979,416 fine ounces or 62 per cent of the total for the province. To the end of 1928 the aggregate yield of gold from the Porcupine area reached a value of more than \$229,000,000.

Kirkland Lake, Ontario's second most important gold-producing area, discovered in 1911 and more actively developed since 1919, yielded 591,797 fine ounces in 1928. Lake Shore, Teck-Hughes and Wright-Hargreaves are the three principal producers. Others of importance in this camp are: Sylvanite, Argonaut, Kirkland Lake and the Barry Hollinger of the Boston Creek camp.

Late in 1925 some apparently important discoveries of gold were made near Red Lake in the district of Patricia, Ontario, near the Manitoba boundary line, and more than 100 miles north of the National Transcontinental Railway line. Several leading gold mining companies became interested in the district and exploration work was carried on in 1926. Attention had been directed to the locality by the Geological Survey over thirty years ago and more recently by the Ontario Bureau of Mines. Geologically, the area is a Precambrian complex. Keewatin lavas and later sediments (conglomerate and slate) are intruded by granite and porphyry. Quartz veins occur, and lavas in contact with quartz porphyry intrusions are characteristically altered.

The knowledge and experience gained in the successful development of gold mining in Ontario during the past thirteen or fourteen years is now leading to re-examination of many localities opened at earlier times especially those along the main line of the Canadian Pacific Railway north of the Great Lakes and in the district of the Lake of the Woods. The Goudreau and Michipicoten areas are among those which are receiving renewed attention. Well-known mining companies are engaged in exploration and development work and results so far obtained are reported as promising.

The producing gold deposits of Ontario occur under somewhat uniform conditions but with local variations. All are in rock of Precambrian age and the principal producing deposits are associated with acid intrusives of Algonian age in volcanic or sedimentary rocks of earlier age.

Besides the production from Ontario's gold mines, an appreciable amount is obtained annually as a by-product from the nickel-copper ores of the Sudbury district. Gold from the International Nickel is obtained in the refining of the precious metals residues of the Port Colborne refinery and gold credited to the Mond Nickel is that recovered from the refinery at Clydach, Wales.

PRAIRIE PROVINCES

Manitoba, Saskatchewan and Alberta.—The major part of the settled portions of the prairie provinces, Manitoba, Saskatchewan and Alberta, is underlain by rocks of sedimentary origin and of comparatively late age. It is, therefore, not likely to contain deposits of the precious metals. Alluvial gold is found in the Saskatchewan river in Alberta, but its recovery has not been found profitable.

The northeastern part of each of these provinces, however, occupies a portion of the Laurentian plateau which is underlain by rocks of Precambrian age and in many places is favourable for the occurrence of gold or other valuable minerals.

In Alberta the Precambrian area is small, about 5,000 square miles, and as yet no gold occurrences have been reported from it. In Saskatchewan, it occupies about one-third of the province and in Manitoba it is still larger, comprising perhaps two-thirds of that province.

Near the margin of the Precambrian, adjacent to the Manitoba-Saskatchewan boundary, is an area known as The Pas district, in which gold, along with copper and pyrites, is found over a wide area, in bodies, some of which are large. A small amount of gold was recovered from some rich copper ores that were mined for a time at the Mandy mine in this district. Free milling gold was also mined for a time at the Rex mine, in the Herb or Wekusko lake district, eighty miles northeast of The Pas.

Other deposits of both classes of ore are found in the region and have received more or less development. Enormous deposits of copper-bearing pyrite at Flin Flon, one hundred miles north of The Pas also have an appreciable gold content; the property has been under investigation for some years and the prospects of its being worked soon are very favourable.

In Manitoba, east of Lake Winnipeg, prospecting has been carried on for as long as ten years. Numerous occurrences of free gold have been more or less developed in the vicinity of Rice, Gold, and Long Lakes, and more recently at Bull Dog Lake, near the Ontario boundary line.

The Central Manitoba mine began to operate a new mill towards the close of 1927 and operated continuously through 1928.

Geological conditions are broadly similar to those of other parts of the Precambrian complex in which gold is found.

BRITISH COLUMBIA

British Columbia, holding second place among the gold-producing provinces, contributed in 1928 slightly more than 10 per cent of the Dominion total for this metal, but most of the yield is obtained from the smelting of ores in which other metals predominate. In the early days, placer production from the Cassiar and Cariboo districts was of greater importance than it has been in recent years. From 1858 to 1892 yields from the placer deposits of British Columbia made up the entire production of gold from the province; in 1895 the recovery from gold lode deposits was greater than from the placers. In 1928 placer gold production represented only 3 per cent of the total; gold in bullion from free milling ores made up 8 per cent; gold obtained in blister copper constituted 16 per cent; and gold in ores exported, for treatment and in base bullion, made up the balance or 73 per cent.

In lode mining the Portland Canal division furnishes a large production of gold. In 1928 it yielded more than 66.5 per cent of the gold output of the province. This district includes the Premier mine. Osoyoos, Skeena, Vancouver, Nass River, Atlin, Trail Creek and Nelson divisions follow in importance. The deposits of Portland Canal, Vancouver, Trail, Skeena and Nass are complex ores, which are important for their content of silver or base metals as well as for gold.

The gold lodes of British Columbia are either in or associated with igneous rock, especially where these invade rocks of earlier age. Such conditions obtain over vast areas along the border of the Coast range and also in other parts of the province. Since the main geological features are on a large scale and the province is but sparsely inhabited, it follows that many such zones of contact that are favourable for the occurrence of minerals of value, are still little known in detail over great distances. Consequently the province offers a field for prospecting that is of great magnitude and promise and increased production may be looked for with confidence.

YUKON

Still holding third place among Canada's gold-producing geographical divisions, Yukon Territory produced 34,364 ounces of fine gold in 1928, nearly all of which was from alluvial deposits. Following the discovery of placer gold in the Yukon in 1896, there was a great rush to this new field and the placer gold output from the Territory increased enormously in the next few years, reaching a maximum in 1900 when the yield totalled more than a million ounces of fine gold. For a few years, production continued on a large scale but by 1908 the annual output had dropped to about 174,000 fine ounces. Lode mining was undertaken in a small way about 1910, but production from this source never reached very great proportions. During the years 1909 to 1913 there was once more a steady upward trend, due to increased placer workings. In the following year a recession set in, and the output has shown a continual shrinkage year by year, from 1914 until 1925, when there was again a slight upward turn to production; the output amounted to 47,817 fine ounces in 1925 as compared with a total of 34,825 fine ounces for 1924; in 1927 it receded to 30,935 ounces, but in 1928 production was a little greater than in the previous year at 34,364 fine ounces. There were 3 companies and approximately 36 individual operators working alluvial gold deposits in the Yukon in 1928. Work was done on 90 miles of ditches and the quantity of material handled was estimated at 5,097,182 cubic yards. In crude placer gold, about 80 per cent of the weight is fine gold, 18 per cent silver, and 2 per cent, base metal or material of no value.

(3) The Alluvial Gold Mining Industry

It is very difficult to secure complete information on alluvial mining in Canada since placer fields are mostly remote and except in a few cases are operated by small numbers of men of no fixed abode. Dredging and hydraulicking companies operating in the Yukon Territory send annual returns to the Bureau and with the aid of the *Mining Lands Branch*, Department of Interior, under whose regulations mining is carried on in this territory, more definite information is obtainable. The report of the Gold Commissioner, Dawson, Yukon Territory, regarding mining for the year ending March 31, 1929, is as follows:—

REPORT OF THE GOLD COMMISSIONER, DAWSON, YUKON TERRITORY, REGARDING MINING.
FOR YEAR ENDING 31ST MARCH, 1929

Placer Gold Mining.—The amount of placer gold mined during the year on which royalty export tax was paid was 43,642·83 ounces, an increase over the previous year of 5,761·36 ounces, or an increase in the total revenue of over twenty per cent.

Burrall and Baird, Limited.—This company operated dredge Canadian No. 2 on Hydraulic Mining Lease No. 18. This dredge commenced digging on May 28, and closed down on December 31, having dredged 1,301,000 cubic yards. Practically the whole of this ground was thawed by means of water under pressure. During the season of 1928, 72,600 cubic yards of ground were thawed by cold water process, the water being pumped from the Klondike River and distributed by means of four electrically driven pumps whose maximum flow during the season was 13,000 gallons per minute.

Three Keystone drills operated at the head of the dredge during the entire season drilling for thawing purposes and also for values.

Dredge Canadian No. 3.—The machinery required to equip this dredge arrived during the summer and is now ready to be installed. A crew of men were employed during the last season doing the necessary repair work.

Dredge Canadian No. 4 commenced operations on May 10, on Hydraulic Mining Lease No. 18, and completed its operations on December 3, having dredged 1,294,000 cubic yards. One Keystone drill was operated at the head of this dredge drilling for values.

A new caterpillar was added to the equipment of the company, making four in all, which are in constant use throughout the season, as well as three trucks and nine automobiles.

The Twelvemile Ditch was successfully maintained during the season, and the pipe lines and flumes reconditioned. Two hydraulic pits were continuously worked and the necessary flumes and cuts extended on Jackson and Crofton Hills. Considerable preliminary work was done on Trail Hill. 367,000 cubic yards of gravel and bed rock were washed by hydraulicking and 83,000 twenty-four hour-miners' inches of water used.

An average of eighty-eight men was employed over a period of eight months, and an additional forty men were employed over a period of six months on the Twelvemile Ditch and hydraulics.

Export tax, amounting to \$6,371.94, was paid on gold recovered by the dredges and shipped out of the territory, and \$1,472.35 from hydraulic operations.

The New North West Corporation, Limited.—This company and its subsidiaries, the Dominion Mining Company, Limited, the Big Creek Mining Company, Limited, the Calder Mining Company, Limited, and the Sulphur Mining Company, Limited, carried on extensive operations during the season.

The hydro-electric plant at the North Fork was operated continuously throughout the year and generated a total of 11,770,100 k.w.h. Power was furnished to Burrall and Baird, Limited, to operate their dredges and carry on other enterprises, to the Dominion Mining Company, Limited, the Big Creek Mining Company, Limited, the Calder Mining Company, Limited, and also to the Dawson Electric Light and Power Company, Limited, for light and power for the City of Dawson, and to the Dawson City Water and Power Company, Limited, for pumping and heating the water supply for the City of Dawson.

Klondike Power Canal.—The following work was done on this power canal under Water Grant No. 14, between April 1, and December 18. A preliminary and location survey was made for a distance of sixteen miles; seven miles of high tension, and ten miles of secondary transmission lines were constructed, and a distance of nine miles of high tension line was reconditioned. Two electric shovels, Model No. 37, weighing seventy-five tons each, were freighted a distance of thirty-two miles to Shovel camp on the new canal, and were assembled and commenced digging on September 6, closed down on December 1, digging 7·17 miles of ditch. A log dam was also constructed across Lee Creek.

North Fork Canal.—This canal was kept in efficient condition during the season. An eight inch gravel pump and steel pontoons with the necessary electric equipment were freighted to the North Fork intake and used during the season for cleaning out and increasing the depth of the canal. Eighty miles of power line were kept in efficient repair during the year.

Dredge New North West No. 1 commenced digging on May 16, on Creek Claim No. 7A above Lower Discovery on Dominion Creek and closed down on November 25, on Creek Claim No. 12 above Lower Discovery, having dredged 721,865 cubic yards of gravel and bed rock during the season. A thawing plant of 1,600 points was operated by two electrically driven pumps which supplied 6,000 gallons of water per minute under a pressure of thirty pounds at the points.

Dredge New North West No. 2 commenced digging on May 24, on Creek Claim No. 243 below Lower Discovery on Dominion Creek, and closed down on Creek Claim No. 253, having dredged 465,137 cubic yards during the season. A thawing plant of 1,000 points was operated and an area of 53,932 yards thawed during the season.

Export tax on gold recovered and shipped out of the territory was paid in the amount of \$5,379.61. An average of eighty-eight men was employed over a period of seven months.

Other Placer Operations.—Many individuals and miners working in partnership were engaged in placer mining and experienced a successful season. Prospecting leases were issued on Thistle Creek, and it is anticipated that work will be commenced on them this summer.

Lode Mining.—Dawson District.—Development work has been continued on the Lone Star group of claims on Victoria Gulch, and the showing was very satisfactory. No ore was shipped, but additional capital has been obtained and it is intended to prosecute development vigorously during the coming year.

Claims on the Fifteenmile on the Yukon River, on Eldorado Creek, on Little Twelvemile and on Gold Run are still being held, but no extensive work has been done. No development work has been done on the Indian River conglomerate, but there are several claims being held with the hope of obtaining capital for development.

Mayo District.—Keno Hill still continues to be the principal producer in this district. The chief operator is the Treadwell Yukon Company, Limited. This company mined some 45,500 tons of ore. The mill operated 94.4% of the total time and produced 382 tons of concentrates for the Treadwell Yukon Company, Limited, and 4,500 tons on the "Sadie" Lease. They shipped altogether some 5,100 tons of ore, the gross value of which was \$1,800,000.00, and in addition were instrumental in shipping some 1,375 tons for individuals. The 1929 shipments promise to be even larger, and it is estimated that a total of 7,600 dry tons will be shipped having a gross metal valuation of over two and one-half million dollars.

New Construction.—During the past year a new 240 h.p. Diesel engine has been installed to supply power for additional motors, also a wire rope tram 4,455 feet long, with the necessary loading and discharging terminals, was built connecting the "Lucky Queen" No. 2 shaft with the mill on the "Ladue" claim. The company also acquired the right to purchase two additional groups of claims on Galena Hill, so that they now have a total area of 1,383 acres divided into four separate groups of claims.

In the Beaver River District prospecting and developing are continuing by individuals as well as The Consolidated Smelting and Mining Company. This company had five men working for three months last summer preparing sites for drill work. A diamond drill and equipment has been freighted to McKay Hill where work is to be started this spring in an effort to determine the value of the ore body at the one thousand foot level.

The outlook for lode mining in the territory is very bright. The ore shipments from the Mayo district are increasing every year, and more prospecting and developing of individual properties is being done than ever before. Several outfits are getting ready to go by aeroplane to different parts of the territory, which were formerly practically inaccessible by ordinary methods of transportation. They will spend the summer months in prospecting, which will no doubt open up new and promising fields to the hard rock and placer miners.

The Five Fingers Coal Company operated their mine during the year and shipped considerable tonnage to Dawson.

British Columbia.—In 1926 arrangements were made with the Department of Mines of British Columbia whereby the annual mining returns were collected by the province and forwarded to the Bureau of Statistics. This method enabled the Bureau to get reports from a larger number of small operators than was previously possible, more particularly with regard to alluvial gold.

Nearly all the alluvial gold recovered in 1928 in British Columbia was obtained from the Atlin, Cariboo and Quesnel divisions. In Atlin production was slightly higher than in 1927 but there was a marked decrease in the Cariboo and Quesnel output. Although total production was less in 1928, much exploratory work was carried on, and it is hoped this will result in larger outputs in the future.

Table 63.—Principal Statistics of the Alluvial Gold Mining Industry in Canada, 1927 and 1928

Item	British Columbia		Yukon		Canada	
	1927	1928	1927	1928	1927	1928
Number of firms and individual operators*..	38	43	56	39	94	82
Time in operation—months.....	6-8	6-8	6-8	6-8	6-8	6-8
Capital employed..... \$	1,129,059	1,804,645	8,524,664	8,579,930	9,653,723	10,384,575
Number of employees.....	167	200	154	142	321	342
Wages paid..... \$	161,617	168,212	310,979	370,058	472,596	538,270
Fuel and electricity used..... \$	8,816	7,534	22,018	49,644	30,834	57,178
Electricity generated—						
(a) for own use..... k.w.h.			2,014,730	3,080,890	2,014,730	3,080,890
(b) for sale..... k.w.h.			3,814,720	6,744,140	3,814,720	6,744,140
Value of electricity sold..... \$			58,294	67,741	58,294	67,741
Crude gold recovered..... crude oz.	9,191	8,424	38,073	42,045	47,264	51,069
Value of gold and silver..... \$	152,932	140,189	640,141	709,727	793,073	849,916
Platinum recovered..... crude oz.	21	49			21	49
Value of platinum recovered..... \$	960	2,819			960	2,819
Quantity of material handled..... cubic yd.	2,470,552	1,188,667	2,421,489	5,097,182	4,892,041	6,285,849
Length of ditches..... miles	37	81	67	90	104	171
Total value of alluvial gold production..... \$	153,892	143,008	640,141	709,727	794,033	852,735

*In addition to the number shown in the table there were many individual operators from whom no returns were available.

(4) The Auriferous Quartz Mining Industry

This industry includes the mining and milling of ores in which gold is the predominating metal. In Nova Scotia these ores may contain arsenic but the gold is mainly recovered by amalgamation. In Ontario where large gold properties have been developed in recent years the ores contain gold and silver in the average proportion of 7 ounces of gold to 1 of silver. These metals are mostly recovered from the ores by cyanidation though amalgamation is also used at two mines. In Manitoba one mine using the cyanide method is in operation. In British Columbia cyanidation is used at some of the gold properties whilst at the most important gold producer in this western province, the Premier mine, the ores are concentrated and the concentrates are shipped to Canadian and United States smelters. In the Premier ores the proportion of silver to gold is about 25 to 1.

Table 64.—Capital Employed by Provinces in the Auriferous Quartz Mining Industry in Canada, 1927 and 1928

	*Nova Scotia		Ontario		British Columbia		Canada	
	No.	\$	No.	\$	No.	\$	No.	\$
1927								
Producing.....	8	8,261,017	19	75,219,335	10	13,197,962	37	96,678,314
Operating but not producing.....	6	1,988,519	27	19,118,622	6	596,013	39	21,703,154
Total.....	14	10,249,536	46	94,337,957	16	13,793,975	76	118,381,468
1928								
Producing.....	5	4,921,235	20	82,359,828	9	12,132,661	34	99,413,724
Operating but not producing.....	10	4,308,057	48	40,732,215	8	3,239,714	66	48,279,986
Total.....	15	9,229,292	68	123,092,043	17	15,372,375	100	147,693,710

*Includes data for 1 producing mine in Manitoba in 1927, and for 1 producing and 1 non-producing in Manitoba in 1928, also for 1 producing and 4 non-producing in Quebec in 1928.

Table 65.—Ores Mined and Milled, Crude Bullion Produced and Shipped from the Auriferous Quartz Mines in Canada, by Provinces, 1927 and 1928

	*Nova Scotia	Ontario	British Columbia	Canada
1927				
Number of producing mines.....	8	19	10	37
Ore mined..... tons	6,191	4,291,041	307,958	4,695,190
Ore milled..... tons	12,161	4,291,041	211,187	4,514,389
Tailings re-treated..... tons	10,000	5	43,150	53,155
Bullion recovered by amalgamation..... crude oz.	2,395	146,881	8,884	158,160
Bullion recovered by cyanidation..... crude oz.	310	2,021,985	14,381	2,036,676
Bullion shipped..... crude oz.	2,705	2,167,293	23,571	2,193,569
Contents of bullion shipped—Gold..... fine oz.	2,383	1,619,147	16,619	1,638,149
Silver..... fine oz.	137	266,946	2,452	269,535
Value..... \$	49,330	33,621,783	326,314	33,997,427
Net value of ores, slags and residues sold..... \$	20,700	94,852	3,340,016	3,455,568
Total net receipts..... \$	70,030	33,716,635	3,666,330	37,452,995
1928				
Number of producing mines.....	5	20	9	34
Ore mined..... tons	55,079	4,212,789	333,760	4,601,628
Ore milled..... tons	55,124	4,218,680	209,249	4,483,053
Tailings re-treated..... tons	1,586	143,500	43,536	145,095
Bullion recovered by amalgamation..... crude oz.	53,734	1,825,525	26,601	1,905,860
Bullion recovered by cyanidation..... crude oz.	55,830	1,967,217	26,601	2,049,648
Bullion shipped..... crude oz.	21,566	1,569,614	16,157	1,607,337
Content of bullion shipped—Gold..... fine oz.	1,881	241,824	1,536	245,241
Silver..... fine oz.				
Value..... \$	443,463	32,586,436	334,643	33,364,542
Exchange premium..... \$		2,811		2,811
Net value of ores, slags and residues sold..... \$		44,139	3,243,838	3,287,977
Total net receipts..... \$	443,463	32,633,386	3,578,481	36,655,330

*Includes data for 1 mine in Manitoba in 1927, and for 1 producing and 1 non-producing in Manitoba in 1928, also for 1 producing and 4 non-producing in Quebec in 1928.

Table 66.—Ores, Concentrates and Slags Shipped from the Auriferous Quartz Mines in Canada, 1927 and 1928

Item	*Ontario mines shipping		British Columbia mines shipping		Canada
	To Canadian smelters	To Foreign smelters	To Canadian smelters	To Foreign smelters	
1927					
Number of mines.....		5	4	4	13
Tons of ore, etc., shipped.....		1,824	18,327	106,281	126,432
Metal content—					
Gold..... oz.		4,066	11,565	109,957	125,588
Silver..... oz.		5,105	451,001	2,845,315	3,301,421
Copper..... lb.		289,382			289,382
Lead..... lb.			165		165
Zinc..... lb.			20		20
Arsenic..... lb.		35,000		1,231,790	1,266,790
Net value..... \$		115,552	374,390	2,965,626	3,455,568
1928					
Number of mines.....	2	3	7	2	14
Tons of ore, etc. shipped.....	2	197	21,003	111,748	132,950
Metal content—					
Gold..... oz.	16	1,582	13,748	119,637	134,983
Silver..... oz.	630	5,771	313,916	2,182,405	2,502,722
Copper..... lb.	586	71,839	28	323	72,776
Lead..... lb.			635	46	681
Zinc..... lb.					
Arsenic..... lb.				1,318,000	1,318,000
Net value..... \$	630	43,509	337,929	2,905,909	3,287,977

*Includes data for 1 mine in Nova Scotia in 1927.

Table 67.—Employees, Salaries and Wages in the Auriferous Quartz Mining Industry in Canada by Provinces, 1927 and 1928

Province	1927					1928						
	Number of employees				Salaries and wages	Number of employees				Salaries and wages		
	On salary	Wage-earners				Total employees	On salary	Wage-earners			Total employees	
		Sur-face	Under-ground	Mill				Sur-face	Under-ground			Mill
Nova Scotia.....	14	128	77	43	262	\$ 187,198	9	42	41	4	96	\$ 75,172
Quebec.....							32	154	7		193	342,922
Ontario.....	421	1,725	4,250	655	7,051	11,525,467	492	2,098	4,714	630	7,934	12,714,888
Manitoba.....	8	35	24	18	85	164,041	10	48	87	9	154	307,456
British Columbia.....	44	210	317	53	624	1,059,013	65	255	304	65	689	1,175,552
Canada.....	487	2,098	4,668	769	8,022	12,935,719	608	2,597	5,153	708	9,066	14,615,990

Table 68.—Wage-Earners in the Auriferous Quartz Mining Industry in Canada by Months, 1927 and 1928

Month	1927				1928			
	Mine			Total	Mine			Total
	Surface	Under- ground	Mill		Surface	Under- ground	Mill	
January.....	1,642	4,369	699	7,010	2,289	4,717	685	7,691
February.....	1,925	4,414	716	7,055	2,384	4,777	679	7,840
March.....	1,843	4,437	740	7,020	2,475	4,855	690	8,020
April.....	1,866	4,591	751	7,208	2,447	4,845	709	8,001
May.....	1,904	4,560	718	7,182	2,579	4,906	697	8,182
June.....	2,001	4,563	743	7,307	2,547	5,034	705	8,286
July.....	2,021	4,516	736	7,275	2,437	5,102	684	8,223
August.....	2,116	4,519	726	7,361	2,436	5,052	665	8,153
September.....	2,209	4,592	718	7,519	2,458	5,072	669	8,199
October.....	2,172	4,693	709	7,574	2,493	5,209	672	8,374
November.....	2,209	4,729	689	7,627	2,361	5,156	666	8,183
December.....	2,000	4,620	682	7,302	2,144	4,882	617	7,643

5. The Copper-Gold-Silver Mining Industry

Canada.—The copper-gold-silver mining industry comprises a group of mines producing ore containing copper, gold and silver in which copper values predominate. Most of the producing mines in this class are in British Columbia; Manitoba is known to have big ore reserves of copper and much development work was done in this province in 1928; Ontario properties of this class are still in the prospect stage. The principal mines operating in 1928 were: British Columbia—the Hidden Creek mine which shipped to the Granby Consolidated Mining, Smelting and Power Co., Ltd.; the Britannia mine which exported concentrates to the smelter at Tacoma, Wash.; and the Copper Mountain mine, which shipped concentrates to Trail, B.C., and Tacoma, Wash.; Quebec—the Horne mine of the Horne Copper Corporation shipped to the Noranda smelter owned by the same corporation, and the Consolidated Copper and Sulphur Co., Ltd., operating the Eustis mine, exported concentrates to the United States for treatment.

Because of interplant relations, companies which mine and smelt their own ore sometimes have difficulty in making a separation of the capital employed at the mine and the smelter. The value placed on their own ore at the mine may be nominal and any profit accruing from the operations would appear to be credited to the smelter. For that reason the net value placed on shipments to the smelter may not be the same as a value computed from the metal content as determined by settlement assay.

Table 69.—Capital Employed by Provinces in the Copper-Gold-Silver Mining Industry in Canada, 1927 and 1928

—	Quebec		Ontario		Manitoba		British Columbia		Canada	
	No.	\$	No.	\$	No.	\$	No.	\$	No.	\$
1927										
Producing.....	3						14		17	9,432,013
Operating but not producing.....	88				3		17		108	14,800,156
Total.....	91	12,673,426			3	524,014	31	11,034,729	125	24,232,169
1928										
Producing.....	3		1				15		19	27,096,837
Operating but not producing.....	126		4		7		18		155	22,907,503
Total.....	129	18,765,947	5	4,837,587	7	2,323,507	33	24,137,299	174	50,004,340

Table 70.—Shipments from Copper-Gold-Silver Mines of Canada, 1927 and 1928

Destination	Quantity	Net value	Content as determined by settlement assay			
			Gold	Silver	Copper	Sulphur
	Tons	\$	Fine oz.	Fine oz.	Pounds	Tons
1927						
12 mines shipped to Canadian smelters—						
Ores.....	337,170	1,681,808	10,504	189,326	14,002,517	
Copper concentrates.....	83,422	3,219,267	5,220	225,449	34,235,296	
Pyrite concentrates.....	16,900	57,470				8,262
7 mines shipped to foreign smelters—						
Ores.....	59	1,482	31	1,103	9,017	
Copper concentrates.....	126,006	4,728,012	11,189	240,120	47,534,345	
Pyrite concentrates.....	33,500	134,842				16,651
Total.....	597,057	9,822,881	26,944	655,998	95,781,175	24,913
1928						
12 mines shipped to Canadian smelters—						
†Ores.....	480,768	4,341,241	61,412	272,195	44,211,488	
Copper concentrates.....	104,181	4,397,183	5,717	271,123	40,784,503	
8 mines shipped to Foreign smelters—						
*Ores.....	3,127	47,564	248	1,243	294,654	834
Copper concentrates.....	125,457	6,235,077	17,434	264,981	51,640,970	
Pyrite concentrates.....	65,479	260,454				32,782
Total.....	779,012	15,281,519	84,811	809,542	136,931,615	33,616

†Contained also 674,000 pounds of zinc.

*Contained also 1,730 pounds of cobalt, and 16,997 pounds of arsenic.

Table 71.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, 1927 and 1928

	1927			1928		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
SALARIED EMPLOYEES—						
Total.....	325	15	612,303	424	37	844,646
WAGE-EARNERS—						
Surface.....	2,097	20	4,647,792	2,471	25	5,919,663
Underground.....	1,626			1,820		
Total.....	3,723	20	4,647,792	4,291	25	5,919,663
Total.....	4,048	35	5,260,095	4,715	62	6,764,309

Table 72.—Wage-Earners in the Copper-Gold-Silver Mining Industry in Canada by Months, 1927 and 1928

Month	1927				1928			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	903	1,356	309	2,568	1,288	1,650	297	3,235
February.....	882	1,355	309	2,546	1,390	1,643	298	3,332
March.....	990	1,366	330	2,686	1,536	1,534	297	3,367
April.....	1,107	1,430	348	2,885	1,640	1,573	292	3,505
May.....	1,192	1,456	378	3,026	1,707	1,698	303	3,708
June.....	1,353	1,518	384	3,255	1,922	1,712	316	3,950
July.....	1,442	1,552	380	3,374	1,969	1,648	334	3,951
August.....	1,598	1,666	384	3,648	1,967	1,681	363	4,011
September.....	1,593	1,668	384	3,645	1,856	1,791	369	4,016
October.....	1,672	1,660	360	3,692	1,846	1,855	371	4,072
November.....	1,545	1,620	353	3,518	1,599	1,902	348	3,849
December.....	1,469	1,594	336	3,399	1,519	1,932	335	3,786

Table 73.—Production of Gold in Canada by Provinces and by Sources, 1927 and 1928

Province	1927		1928	
	Fine ounces	Value	Fine ounces	Value
NOVA SCOTIA—		\$		\$
In gold bullion and in concentrates exported.....	3,151	65,137	1,290	26,667
QUEBEC—				
In blister copper and in ores exported.....	8,331	172,217	60,006	1,240,434
ONTARIO—				
Porcupine area—In gold bullion.....	1,153,034	23,835,327	978,172	20,220,609
In slugs exported.....	1,086	22,450	1,244	25,716
Kirkland lake area—In gold bullion.....	466,113	9,635,411	591,466	12,226,687
In slugs exported.....	1,895	39,173	331	6,842
Sudbury area—In matte and blister copper exported.....	4,866	100,589	3,850	79,587
Miscellaneous.....	56	1,158	3,371	69,685
Total.....	1,627,050	33,634,108	1,578,434	32,629,126
MANITOBA—				
In gold bullion.....	182	3,762	19,813	409,571
ALBERTA.....	42	868	68	1,406
BRITISH COLUMBIA—				
In alluvial gold.....	7,353	152,000	6,739	139,307
In gold bullion.....	16,620	343,566	16,157	333,995
In blister copper.....	30,141	623,070	31,057	642,005
In base bullion and in ores exported.....	128,980	2,666,253	142,664	2,949,127
Total.....	183,094	3,784,889	196,617	4,064,434
YUKON—				
In alluvial gold.....	30,778	636,238	34,116	705,240
In ores exported.....	157	3,245	248	5,127
Total.....	30,935	639,483	34,364	710,367
Total Canada.....	1,852,785	33,390,464	1,899,592	39,082,005

Table 74.—Production of Gold from Canadian Sources, 1858-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1858.....	34,104	705,000	1882.....	60,288	1,246,268	1906.....	556,415	11,502,120
1859.....	78,129	1,615,072	1883.....	53,853	1,113,246	1907.....	405,517	8,382,780
1860.....	107,806	2,228,543	1884.....	51,202	1,058,439	1908.....	476,112	9,842,105
1861.....	128,973	2,666,118	1885.....	55,575	1,148,829	1909.....	453,865	9,382,230
1862.....	135,391	2,798,774	1886.....	70,782	1,463,196	1910.....	493,707	10,205,835
1863.....	202,498	4,186,011	1887.....	57,460	1,187,804	1911.....	473,159	9,781,077
1864.....	199,605	4,126,199	1888.....	53,145	1,098,610	1912.....	611,885	12,648,794
1865.....	192,898	3,987,562	1889.....	62,653	1,295,159	1913.....	802,973	16,598,923
1866.....	152,555	3,153,597	1890.....	55,620	1,149,776	1914.....	773,178	15,983,007
1867.....	145,775	3,013,431	1891.....	45,018	930,614	1915.....	918,056	18,977,901
1868.....	134,169	2,773,527	1892.....	43,905	907,601	1916.....	930,492	19,234,976
1869.....	102,720	2,123,405	1893.....	47,243	976,603	1917.....	738,831	15,272,592
1870.....	83,415	1,724,348	1894.....	54,600	1,128,658	1918.....	699,681	14,463,689
1871.....	105,187	2,174,412	1895.....	100,798	2,083,674	1919.....	766,764	15,850,423
1872.....	90,283	1,866,321	1896.....	133,262	2,754,774	1920.....	765,007	15,814,098
1873.....	74,346	1,536,871	1897.....	291,557	6,027,016	1921.....	926,329	19,148,920
1874.....	97,856	2,022,862	1898.....	666,336	13,775,420	1922.....	1,263,364	26,116,050
1875.....	130,300	2,693,533	1899.....	1,028,529	21,261,584	1923.....	1,233,341	25,495,421
1876.....	97,729	2,020,233	1900.....	1,350,057	27,908,153	1924.....	1,525,382	31,532,443
1877.....	94,304	1,949,444	1901.....	1,167,216	24,128,503	1925.....	1,735,735	35,880,826
1878.....	74,420	1,538,394	1902.....	1,032,161	21,336,667	1926.....	1,754,228	36,263,110
1879.....	76,547	1,582,353	1903.....	911,559	18,843,590	1927.....	1,852,785	38,300,464
1880.....	62,121	1,304,824	1904.....	796,374	16,462,517	1928.....	1,893,592	39,082,005
1881.....	63,524	1,313,153	1905.....	684,951	14,159,195	Total.....	33,587,247	694,310,107

*Calculated from the value \$1=0.043875 ounces.

Refined Gold.—Two refineries produced fine gold in Canada in 1928, namely the Royal Mint, Ottawa, and the Consolidated Mining and Smelting Company of Canada, Limited, at Tadanac, near Trail, B.C. From all ores treated in 1928, the latter company produced 22,754 fine ounces. This gold was recovered principally from the gold in copper ores, but some was also recovered from silver-lead and dry ores. Small quantities of imported ores were also treated by this company.

Gold refined at the Royal Mint at Ottawa from the gold produced in Nova Scotia, Quebec, Ontario, Manitoba, Alberta, and British Columbia and from the alluvial gold obtained in the Yukon, amounted to 1,325,113 fine ounces, including a small amount recovered from scrap and crude gold from various sources. The total production in Canada of refined gold during 1928 was, therefore, 1,347,867 fine ounces.

Table 75.—Refined Gold Produced at Trail, B.C., 1904-1928*

Year	Fine Ounces	Year	Fine Ounces
1904.....	4,336	1917.....	49,661
1905.....	8,602	1918.....	61,212
1906.....	9,993	1919.....	47,283
1907.....	10,395	1920.....	42,636
1908.....	15,346		
1909.....	18,241	1921.....	56,297
1910.....	13,298	1922.....	18,940
		1923.....	11,113
1911.....	15,270	1924.....	23,412
1912.....	12,118	1925.....	18,441
1913.....	11,977		
1914.....	11,088	1926.....	49,607
1915.....	17,813	1927.....	29,334
1916.....	23,608	1928.....	22,754

*Includes some gold derived from imported ores and from occasional shipments from Ontario, Manitoba, Alberta and the Yukon.

Table 76.—Receipts of Gold Bullion from Canadian Sources at the Royal Mint, Ottawa, Ont., 1908-1928

Year	From Canadian Sources		From Foreign Countries	
	Crude oz.	Value gold content	Crude oz.	Value gold content
		\$		\$
1908.....	219-19	3,823.03		
1909.....	5,741-43	94,864.81	38-25	673.93
1910.....	65,009-35	1,079,223.42		
1911.....	89,433-11	1,469,087.43	511-24	9,128.55
1912.....	104,825-29	1,676,271.78	742-79	12,451.33
1913.....	212,076-41	3,363,870.30	633-23	11,609.84
1914.....	29,762-24	471,042.90	4,750-19	98,062.84
1915.....	89,231-47	1,402,605.19	871,693-79	15,838,222-01
1916.....	49,195-39	780,074.19	6,687,758-41	121,513,083.93
1917.....	55,779-96	840,265.33	8,196,151-04	148,919,793.48
1918.....	302,785-96	4,982,743.81	3,728,224-05	67,739,887.68
1919.....	654,906-28	10,865,770.57	8,917-02	134,756.38
1920.....	724,083-34	11,530,413.82		
1921.....	1,054,277-01	16,914,211.58	53-00	826.87
1922.....	1,376,863-35	22,469,160.42	345-22	5,387.93
1923.....	779,466-92	12,682,163.78	295-53	4,935.16
1924.....	169,239-28	2,297,170.32	90-53	1,395.41
1925.....	167,375-64	2,489,532.52	192-35	2,900.59
1926.....	1,766,031-26	28,432,544.12	104-93	1,615-15
1927.....	1,869,208-25	29,929,047-51	496-75	7,488-31
1928.....	1,709,468-93	27,392,160-48	25-20	349-79

Table 77.—Receipts at the Royal Mint, Ottawa, Ont., by Sources, 1927 and 1928

Source	1927			1928		
	Gross weight	Precious metal content		Gross weight	Precious metal content	
		Fine gold	Fine silver		Fine gold	Fine silver
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
Nova Scotia.....	2,395-40	2,201-468	125-13	1,535-81	1,289-86	77-33
New Brunswick.....						
Quebec.....				509-70	463-52	40-74
Ontario.....	1,721,110-57	1,338,191-977	229,687-45	1,587,294-54	1,217,622-04	199,470-15
Manitoba.....	310-35	182-336	12-20	44,550-96	15,037-18	1,272-48
Saskatchewan.....						
Alberta.....	48-15	41-633	4-42			
British Columbia.....	8-44	7-030	0-66	3-33	20-06	71-08
Dominion of Canada Assay Office, Vancouver.....	111,197-14	92,320-267	14,875-74	92,051-40	76,134-20	11,914-42
Yukon.....						
Jewellery and scrap, various sources.....	34,138-20	14,873-012	4,930-92	33,673-19	14,528-92	4,729-74
Foreign.....	496-75	362-247	107-05	25-20	16-92	6-99
Total.....	1,869,705-00	1,448,179-970	249,713-57	1,709,494-13	1,325,112-70	217,582-93

Table 78.—Crude Bullion Received at Dominion Government Assay Office, Vancouver, B.C., 1908-1928

Year	Weight before melting	Weight after melting	Net value	Year	Weight before melting	Weight after melting	Net value
	Ounces	Ounces	\$		Ounces	Ounces	\$
1908 (a).....	90,175-48	89,117-76	1,478,894-00	1918.....	241,762-77	238,245-07	4,099,595-80
1909.....	48,478-58	47,576-27	759,267-94	1919.....	209,026-14	205,947-57	3,547,524-93
1910.....	46,064-31	45,228-92	746,101-92	1920.....	150,869-17	147,718-25	2,499,174-41
1911.....	39,784-70	39,069-31	647,416-38	1921.....	163,070-56	160,803-48	2,834,499-61
1912.....	59,068-82	57,951-98	974,077-14	1922.....	129,891-63	125,758-41	2,105,989-64
1913 (b).....	111,479-94	109,920-49	1,448,625-37	1923.....	129,043-63	124,546-48	2,051,369-65
1914.....	166,148-83	163,523-61	2,029,251-31	1924.....	114,041-96	107,569-15	1,850,373-74
1915.....	183,924-49	179,751-68	2,736,302-31	1925.....	140,691-78	123,202-39	2,065,217-16
1916.....	180,292-83	175,393-10	2,828,239-65	1926.....	162,606-56	145,279-61	2,524,337-58
1917.....	191,626-04	187,884-48	3,257,220-71	1927.....	103,080-89	102,192-93	1,750,599-35
				1928.....	107,617-27	98,392-98	1,673,926-65

(a) For 9 months only.

(b) The removal of the assay charge in January 1913, accounts for the large increase.

NOVA SCOTIA

Table 79.—Production of Gold from Nova Scotia Ores, 1862-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$
1862.....	6,863	141,871	1896.....	23,876	493,568
1863.....	13,180	272,448	1897.....	27,195	562,165
1864.....	18,883	390,349	1898.....	26,054	538,590
1865.....	24,011	496,357	1899.....	29,876	617,604
			1900.....	28,955	598,553
1866.....	23,776	491,491			
1867.....	25,763	532,563	1901.....	26,459	546,963
1868.....	19,377	400,555	1902.....	30,348	627,357
1869.....	16,855	348,427	1903.....	25,533	527,806
1870.....	18,740	387,392	1904.....	10,362	214,209
			1905.....	13,707	283,353
1871.....	18,139	374,972			
1872.....	12,352	255,349	1906.....	12,223	252,676
1873.....	11,180	231,122	1907.....	13,675	282,686
1874.....	8,623	178,244	1908.....	11,842	244,799
1875.....	10,576	218,629	1909.....	10,193	210,711
			1910.....	7,928	163,891
1876.....	11,300	233,585			
1877.....	15,925	329,205	1911.....	7,781	160,854
1878.....	11,864	245,253	1912.....	4,385	90,638
1879.....	12,980	268,328	1913.....	2,174	44,935
1880.....	12,472	257,823	1914.....	2,904	60,031
			1915.....	6,636	137,180
1881.....	10,147	209,755			
1882.....	13,307	275,090	1916.....	4,562	94,305
1883.....	14,571	301,207	1917.....	2,210	45,685
1884.....	15,168	313,554	1918.....	1,176	24,310
1885.....	20,945	432,971	1919.....	850	17,571
			1920.....	690	14,263
1886.....	22,038	455,564			
1887.....	20,009	413,631	1921.....	439	9,075
1888.....	21,137	436,939	1922.....	1,042	21,540
1889.....	24,673	510,029	1923.....	655	13,540
1890.....	22,978	474,990	1924.....	1,047	21,643
			1925.....	1,626	33,612
1891.....	21,841	451,503			
1892.....	18,865	389,965	1926.....	1,678	34,687
1893.....	18,436	381,095	1927.....	3,151	65,137
1894.....	18,834	389,338	1928.....	1,290	26,667
1895.....	21,919	453,119			
Total.....			920,249 19,023,317		

*Calculated from the value: one dollar=0.048375 ounces.

QUEBEC

Table 80.—Production of Gold from Quebec Ores, 1877-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value.
		\$			\$			\$
1877.....	583	12,057	1895.....	62	1,281	1912.....	642	13,270
1878.....	868	17,937				1913.....	701	14,491
1879.....	1,160	23,972	1896.....	145	3,000	1914.....	1,292	26,708
1880.....	1,605	33,174	1897.....	44	900	1915.....	1,099	22,720
			1898.....	295	6,089			
1881.....	2,741	56,661	1899.....	238	4,916	1916.....	1,034	21,375
1882.....	827	17,093	1900.....			1917.....	1,511	31,235
1883.....	860	17,787				1918.....	1,939	40,083
1884.....	422	8,720	1901.....	145	3,000	1919.....	1,470	30,388
1885.....	103	2,120	1902.....	391	8,073	1920.....	955	19,742
			1903.....	180	3,712			
1886.....	193	3,981	1904.....	140	2,900	1921.....	635	13,127
1887.....	75	1,604	1905.....	191	3,940	1922.....		
1888.....	181	3,740				1923.....	667	13,788
1889.....	58	1,207	1906.....	165	3,412	1924.....	833	18,253
1890.....	65	1,350	1907.....			1925.....	1,602	33,116
			1908.....					
1891.....	87	1,800	1909.....	193	3,990	1926.....	3,680	76,072
1892.....	628	12,987	1910.....	124	2,565	1927.....	8,331	172,217
1893.....	750	15,696				1928.....	60,006	1,240,434
1894.....	1,412	29,196	1911.....	613	12,672			
Total.....			102,003 2,108,551					

*Calculated from the value: one dollar=0.048375 ounces.

ONTARIO

Table 81.—Production of Gold from Ontario Ores, 1887-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1887.....	327	6,760	1902.....	11,118	229,828	1916.....	492,481	10,180,485
1888.....			1903.....	9,096	188,036	1917.....	423,261	8,749,581
1889.....			1904.....	1,935	40,000	1918.....	411,976	8,516,299
1890.....			1905.....	4,402	91,000	1919.....	505,739	10,454,553
						1920.....	564,995	11,679,483
1891.....	97	2,000	1906.....	3,202	66,193			
1892.....	344	7,118	1907.....	3,212	66,398	1921.....	708,213	14,640,062
1893.....	708	14,637	1908.....	3,212	66,398	1922.....	1,000,340	20,678,862
1894.....	1,917	39,624	1909.....	1,569	32,425	1923.....	971,704	20,086,904
1895.....	3,015	62,320	1910.....	3,089	63,849	1924.....	1,241,728	25,668,795
						1925.....	1,461,039	30,202,357
1896.....	5,563	115,000	1911.....	2,062	42,025			
1897.....	9,157	189,294	1912.....	86,523	1,788,596	1926.....	1,497,215	30,950,180
1898.....	12,863	265,889	1913.....	219,801	4,543,690	1927.....	1,627,050	33,634,108
1899.....	20,394	421,591	1914.....	268,264	5,545,509	1928.....	1,578,434	32,629,126
1900.....	14,391	297,495	1915.....	406,577	8,404,693			
1901.....	11,844	244,837				Total.....	13,588,857	280,906,600

*Calculated from the value: one dollar=0.048375 ounces.

MANITOBA

Table 82.—Production of Gold from Manitoba Ores, 1917-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$
1917.....	440	9,095	1923.....	31	641
1918.....	1,926	39,814	1924.....	1,180	24,393
1919.....	724	14,966	1925.....	4,424	91,452
1920.....	781	16,145			
			1926.....	188	3,886
1921.....	207	4,279	1927.....	182	3,762
1922.....	156	3,225	1928.....	19,813	409,571
			Total.....	30,052	621,229

*Calculated from the value: one dollar=0.048375 ounces.

ALBERTA

Table 83.—Production of Gold from Alberta, 1887-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1887.....	102	2,100	1902.....	484	10,000	1917.....		
1888.....	58	1,200	1903.....	48	1,000	1918.....	27	558
1889.....	967	20,000	1904.....	24	500	1919.....	24	500
1890.....	193	4,000	1905.....	121	2,500	1920.....		
1891.....	266	5,500	1906.....	39	800	1921.....	49	1,013
1892.....	508	10,503	1907.....	33	675	1922.....		
1893.....	466	9,640	1908.....	50	1,037	1923.....		
1894.....	726	15,000	1909.....	25	525	1924.....		
1895.....	2,419	50,000	1910.....	89	1,850	1925.....		
1896.....	2,661	55,000	1911.....	10	207	1926.....		
1897.....	2,419	50,000	1912.....	73	1,509	1927.....	42	834
1898.....	1,209	25,000	1913.....			1928.....	68	1,400
1899.....	726	15,000	1914.....	48	992			
1900.....	242	5,000	1915.....	195	4,026	Total.....	15,219	314,607
1901.....	726	15,000	1916.....	82	1,695			

*Calculated from the value: one dollar=0.048375 ounces.

BRITISH COLUMBIA

Table 84.—Production of Gold from British Columbia Ores, 1858-1928

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1858.....	34,104	705,000	1882.....	46,154	954,085	1906.....	269,886	5,579,039
1859.....	78,129	1,615,072	1883.....	38,422	794,252	1907.....	236,216	4,883,020
1860.....	107,806	2,228,543	1884.....	35,612	736,165	1908.....	286,858	5,929,880
			1885.....	34,527	713,738	1909.....	250,320	5,174,579
1861.....	128,973	2,666,118				1910.....	261,386	5,403,318
1862.....	128,528	2,656,903	1886.....	43,714	903,651			
1863.....	189,318	3,913,593	1887.....	33,558	693,709	1911.....	238,496	4,930,145
1864.....	180,722	3,735,850	1888.....	29,834	616,751	1912.....	251,815	5,205,485
1865.....	168,887	3,491,205	1889.....	28,489	588,923	1913.....	297,459	6,149,027
			1890.....	23,918	494,436	1914.....	252,730	5,224,393
1866.....	128,779	2,662,106				1915.....	273,376	5,651,184
1867.....	120,012	2,480,868	1891.....	20,792	429,811			
1868.....	114,792	2,372,972	1892.....	19,327	399,525	1916.....	219,633	4,540,216
1869.....	85,865	1,774,978	1893.....	18,360	379,535	1917.....	133,742	2,764,693
1870.....	64,675	1,336,956	1894.....	25,664	530,530	1918.....	180,163	3,724,300
			1895.....	61,289	1,266,954	1919.....	167,252	3,457,406
1871.....	87,048	1,799,440				1920.....	124,808	2,580,010
1872.....	77,931	1,610,972	1896.....	86,504	1,788,206			
1873.....	63,166	1,305,749	1897.....	131,805	2,724,657	1921.....	150,792	3,117,147
1874.....	89,233	1,844,618	1898.....	142,215	2,939,852	1922.....	207,370	4,286,713
1875.....	119,724	2,474,904	1899.....	203,295	4,202,473	1923.....	200,140	4,137,261
			1900.....	228,916	4,732,105	1924.....	245,719	5,079,462
1876.....	86,429	1,786,648				1925.....	219,227	4,531,824
1877.....	77,796	1,608,182	1901.....	257,292	5,318,703			
1878.....	61,688	1,275,204	1902.....	288,383	5,961,409	1926.....	225,866	4,669,065
1879.....	62,407	1,290,058	1903.....	284,108	5,873,036	1927.....	183,094	3,784,889
1880.....	49,044	1,013,827	1904.....	275,975	5,704,908	1928.....	196,617	4,064,434
			1905.....	285,529	5,902,402			
1881.....	50,636	1,046,737				Total.....	10,072,339	208,213,764

* Calculated from the value: one dollar=0.048375 ounces.

Table 85.—Production of Gold, in British Columbia by Districts, 1927 and 1928

(From Annual Report of the Minister of Mines for British Columbia)

District and division	1927				1928			
	Gold alluvial*		Gold lode		Gold alluvial*		Gold lode	
	Ounces	Value	Ounces	Value	Ounces	Value	Ounces	Value
		\$		\$		\$		\$
Northwestern District (No. 1)—								
Atlin.....	2,428	41,276	2,030	41,964	3,174	53,958	193	3,990
Stikine.....					29	493		
Liard.....	365	6,205			334	5,678		
Nass River.....			4,960	102,532			5,100	105,426
Portland Canal.....			122,242	2,526,962			130,304	2,693,618
Skeena.....	105	1,785	56	1,158	30	510	139	2,874
Queen Charlotte.....								
Bella Coola.....								
Northeastern District (No. 2)—								
Cariboo.....	3,125	53,125			2,287	38,879		
Quesnel.....	2,319	39,423			1,649	28,033		
Omineca.....	236	4,012	165	3,411	235	3,995	477	9,860
Peace River.....	177	3,009			200	3,400		
Central District (No. 3)—								
Nicola.....							1	21
Vernon.....	3	51	6	124			2	41
Yale.....	30	510			20	340		
Ashcroft.....			1	21				
Kamloops.....	5	85	326	6,739	15	255	157	3,246
Lillooet.....	59	1,003	5,979	123,596			7,730	159,793
Clinton.....	133	2,261			186	3,162		
Southern District (No. 4)—								
Grand Forks.....			1	21				
Greenwood.....			114	2,357			134	2,770
Osoyoos.....			12,851	265,653			11,843	244,816
Similkameen.....	59	1,003	4,031	83,328	242	4,114	5,265	108,837
Eastern District (No. 5)—								
Fort Steele.....	126	2,142	939	19,411	23	391	731	15,111
Windermere.....							3	62
Golden.....	21	357	2	41				
Ainsworth.....			123	2,542			148	3,059
Slocan.....			176	3,638			383	7,917
Slocan City.....							41	848
Nelson.....			7,035	145,426			2,712	56,062
Arrow Lake.....								
Trail Creek.....			6,625	136,951			7,424	153,467
Revelstoke.....							1	21
Trout Lake.....							7	145
Lardeau.....			1	21			15	310
Western District (No. 6)—								
Nanaimo.....			2	41				
Alberni.....								
Clayoquot.....								
Quatsino.....								
Victoria.....								
New Westminster.....								
Vancouver.....			10,336	213,664			15,277	315,803
Total.....	9,191	156,247	178,001	3,679,601	8,424	143,208	188,087	3,888,097

*Alluvial gold is valued at \$17 an ounce, which is believed to be a fair average for the whole province.

YUKON

Table 86.—Production of Gold from the Yukon, 1885-1928

Year	Fine ounces *	Value	Year	Fine ounces *	Value	Year	Fine ounces *	Value
		\$			\$			\$
1885)			1901.....	870,750	18,000,000	1916.....	212,700	4,396,900
1886).....	4,837	100,000	1902.....	701,437	14,500,000	1917.....	177,667	3,672,703
1887.....	3,386	70,000	1903.....	592,594	12,250,000	1918.....	102,474	2,118,325
1888.....	1,935	40,000	1904.....	507,938	10,500,000	1919.....	90,705	1,875,039
1889.....	8,466	175,030	1905.....	381,001	7,876,000	1920.....	72,778	1,504,455
1890.....	8,466	175,000						
1891.....	1,953	40,000	1906.....	270,900	5,600,000	1921.....	65,994	1,364,217
1892.....	4,233	87,500	1907.....	152,381	3,150,000	1922.....	54,456	1,125,705
1893.....	8,514	176,000	1908.....	174,150	3,600,000	1923.....	60,144	1,243,287
1894.....	6,047	125,000	1909.....	191,535	3,960,000	1924.....	34,825	719,897
1895.....	12,094	250,000	1910 (a).....	221,091	4,570,362	1925.....	47,817	988,465
1896.....	14,513	300,000	1911.....	224,197	4,634,574	1926 (b).....	25,601	529,220
1897.....	120,937	2,500,000	1912.....	268,447	5,549,296	1927.....	30,935	639,483
1898.....	483,750	10,000,000	1913.....	282,838	5,846,780	1928.....	34,364	710,367
1899.....	774,000	16,000,000	1914.....	247,940	5,125,374			
1900.....	1,077,553	22,275,000	1915.....	230,173	4,758,098			
Total.....							8,858,516	183,122,047

(*) Calculated from the value: one dollar=0.048375 ounces.

(a) Includes a small production from lode mines, from 1910 to 1923 inclusive.

(b) Includes a small production from lode mines in 1926.

Table 87.—Receipts from the Yukon, at the Dominion of Canada Assay Office, Vancouver, B.C., 1908-1928

Year	Weight before melting	Net value	Average value	Year	Weight before melting	Net value	Average value
	Ounces	\$	\$		Ounces	\$	\$
1908 (a).....	60,132.00	1,000,296	16.62	1918.....	121,310.37	1,921,198	15.84
1909.....	5,003.12	83,871	16.75	1919.....	111,138.65	1,813,883	16.32
1910.....	3,594.87	62,094	17.27	1920.....	74,456.01	1,206,579	16.21
1911.....	2,073.61	34,944	16.88	1921.....	82,219.92	1,340,225	16.30
1912.....	2,211.88	36,481	16.41	1922.....	69,161.19	1,126,702	16.29
1913 (b).....	15,235.29	247,189	16.22	1923.....	73,360.82	1,201,133	16.27
1914.....	56,564.83	915,914	16.21	1924.....	44,365.96	717,156	16.17
1915.....	87,040.87	1,418,497	16.28	1925.....	61,096.43	977,624	16.00
1916.....	95,005.82	1,525,724	16.09	1926.....	32,686.16	537,822	16.46
1917.....	79,532.35	1,262,207	15.87	1927.....	39,436.44	649,702	16.47
				1928.....	42,993.43	693,765	16.13

(a) For nine months only.

(b) The removal in 1913 of the assay charge, accounts for the great increase.

Table 88.—Production of Alluvial Gold in the Yukon by Months, 1926-1928

(Gross weight of dust, nuggets, and bullion in ounces)

Month	1926	1927	1928
January.....	4.32	550.09	532.96
February.....		4.00	183.41
March.....	175.64	1,112.59	359.21
April.....			465.49
May.....		973.34	686.79
June.....	2,666.27	5,480.34	5,189.72
July.....	3,219.01	4,335.22	5,692.05
August.....	4,293.52	8,695.88	6,589.03
September.....	4,280.60	6,604.03	10,846.02
October.....	5,564.27	6,584.82	5,383.91
November.....	6,611.83	2,116.05	4,023.29
December.....	3,000.23	2,016.09	2,693.46
Total.....	1,874.53	31,680.23	38,472.45
			42,645.87

From 1898 to March 31, 1929, royalties to the extent of \$4,943,965 were collected on the gold production of the Yukon. The yearly amounts collected, as well as the annual production of gold as ascertained by the *Department of the Interior*, are shown below. The difference between these figures and those shown in the table of annual production, which are based on mint receipts of Yukon gold is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at \$15 per ounce, (2) the probability that, in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small production from lode mines.

Table 89.—Gold Production in the Yukon and the Royalty Collected, 1898-1929

(Supplied by Superintendent H. H. Rowatt, of the Mining Lands Branch of the Department of the Interior.)

Fiscal year	Total gold production	Total exemption	Royalty collected on	Royalty paid
	\$	\$	\$	\$
Ending June, 1898.....	3,072,773	339,845	2,732,928	273,292-82
Ending June, 1899.....	7,582,283	1,699,657	5,882,626	588,262-87
Ending June, 1900.....	9,809,464	2,501,744	7,307,720	730,771-99
Ending June, 1901.....	9,162,082	1,927,666	7,234,416	592,660-98
Ending June, 1902.....	9,566,340	1,199,114	8,367,226	331,436-79
Ending June, 1903..... Since 1902, the Dominion Government has..	12,113,015	.....	12,113,015	302,893-48
Ending June, 1904..... collected a royalty of 2½ per cent on all gold..	10,790,663	.....	10,790,663	272,217-96
Ending June, 1905..... produced; the Government for royalty pur..	8,222,054	.....	8,222,054	206,760-87
Ending June, 1906..... poses, places a nominal value of \$15 on each..	6,540,007	.....	6,540,007	163,963-25
Ending March, 1907..... crude ounce recovered.	3,304,791	.....	3,304,791	82,622-42
Ending March, 1908.....	2,820,162	.....	2,820,162	70,504-65
Ending March, 1909.....	3,260,282	.....	3,260,282	81,507-07
Ending March, 1910.....	3,594,251	.....	3,594,251	89,844-10
Ending March, 1911.....	4,126,728	.....	4,126,728	103,168-19
Ending March, 1912.....	4,024,237	.....	4,024,237	100,606-29
Ending March, 1913.....	5,018,412	.....	5,018,412	125,460-52
Ending March, 1914.....	5,301,508	.....	5,301,508	132,537-69
Ending March, 1915.....	4,649,634	.....	4,649,634	116,241-04
Ending March, 1916.....	4,458,278	.....	4,458,278	111,457-19
Ending March, 1917.....	3,960,207	.....	3,960,207	99,007-92
Ending March, 1918.....	3,266,019	.....	3,266,019	81,650-55
Ending March, 1919.....	1,947,082	.....	1,947,082	48,677-07
Ending March, 1920.....	1,660,450	.....	1,660,450	41,501-12
Ending March, 1921.....	1,246,486	.....	1,246,486	31,273-76
Ending March, 1922.....	1,230,987	.....	1,230,987	30,774-68
Ending March, 1923.....	1,032,762	.....	1,032,762	25,819-04
Ending March, 1924.....	1,136,368	.....	1,136,368	28,409-23
Ending March, 1925.....	625,459	.....	625,459	15,636-48
Ending March, 1926.....	879,819	.....	879,819	21,995-50
Ending March, 1927.....	497,504	.....	497,504	12,437-64
Ending March, 1928.....	568,221	.....	568,221	14,205-55
Ending March, 1929.....	654,672	.....	654,672	16,366-79
Total.....	136,123,000	.....	128,454,974	4,943,965-00

IMPORTS AND EXPORTS

Table 90.—Imports into Canada and Exports of Gold, 1926-1928

	1926	1927	1928
	\$	\$	\$
IMPORTS—			
Coin and bullion—			
Coins, British, Canadian and foreign gold coins.....	45,077,807	30,510,818	27,654,313
Gold bullion, in bars, blocks, ingots, drops, sheets or plates, unmanufactured....	2,048,033	745,820	925,612
Total.....	47,125,840	31,256,638	28,579,925
Gold, other—			
Bullion or fringe gold.....	34,836	31,076	47,527
Manufactures of gold and silver—			
Leaf.....	87,597	98,452	127,085
Sweepings.....	2,676	240	168
Manufactures, n.o.p.....	68,514	85,477	58,275
Electroplated ware.....	846,216	1,013,799	1,252,513
Medals of gold, silver or copper, and other metallic articles, actually bestowed as trophies or prizes, and received and accepted as honorary distinctions, and cups or other metallic prizes won in bona fide competitions.....	21,006	18,365	17,143
Total.....	1,060,845	1,247,409	1,532,721
EXPORTS—			
Coin and bullion—			
Gold coin—			
Canadian.....	4,000,000	1,005	.....
Foreign.....	24,010,603	42,003,384	56,121,042
Gold bullion—			
Canadian.....	41,812,356	5,019,346	48,914,498
Foreign.....	.....	.....	.....
Total—Canadian.....	45,812,356	5,020,351	48,914,498
Foreign.....	24,010,603	42,003,384	56,121,042
Gold-bearing quartz, dust, nuggets and bullion obtained direct from mining operations.....	7,340,451	7,881,512	10,457,877
Jewellers' sweepings.....	326,007	336,081	436,939

WORLD OUTPUT

Table 91.—Comparative Figures of Gold Production, for the World, Africa and Canada, 1915, and 1921-1928

Year	*World's output	*Africa's output	Canada's output
	Fine ounces	Fine ounces	Fine ounces
1915.....	22,593,833	10,538,588	918,056
1921.....	15,983,772	9,044,595	926,329
1922.....	15,444,830	8,009,069	1,263,364
1923.....	17,786,471	10,156,522	1,233,341
1924.....	19,023,134	10,622,168	1,525,382
1925.....	19,031,137	10,582,493	1,735,735
1926.....	19,369,364	10,952,743	1,754,228
1927.....	19,506,743	11,071,621	1,852,785
1928.....	19,753,665	11,300,979	1,890,592

*From the Year Book of the American Bureau of Metal Statistics.

Table 92.—World Production of Gold, (a) 1913 and 1924-1928

(From the Year Book of the American Bureau of Metal Statistics)

(Fine ounces)

	1913	1924	1925	1926	1927	1928
NORTH AMERICA—						
United States.....	4,299,784	2,528,900	2,411,987	2,335,042	2,197,125	2,233,251
Canada.....	802,973	1,525,382	1,735,735	1,754,228	1,852,785	1,890,592
Mexico.....	829,783	792,401	788,993	772,661	725,125	699,102
Total North America.....	5,932,549	4,846,683	4,936,715	4,861,931	4,775,035	4,822,945
Central America and West Indies.....	131,661	87,075	96,756	87,075	72,563	60,469
SOUTH AMERICA—						
Bolivia.....	8,467	964	386	332	241	.....
Chili.....	.....	112,011	105,870	115,579	150,000	50,030
Brazil.....	109,072	120,824	120,337	102,108	103,000	103,115
Colombia.....	143,757	96,750	76,750	71,658	72,563	40,323
Ecuador.....	19,665	38,700	43,537	62,486	64,242	74,572
Peru.....	23,813	118,955	109,935	91,917	92,556	70,504
Guiana—British.....	65,475	7,187	9,107	6,516	5,714	5,325
Dutch.....	22,757	10,352	9,902	7,526	7,684	5,498
French.....	147,571	63,496	40,220	45,235	48,354	45,460
Venezuela.....	21,517	17,361	30,542	30,542	39,366	48,257
Other countries.....	1,572	2,915	2,661	2,419	967	1,474
Total South America.....	563,666	589,515	519,277	536,318	591,787	441,528
EUROPE—						
Austria-Hungary.....	105,425	1,961	1,865	1,318	129	321
Czecho-Slovakia.....	.....	9,002	7,587	7,716	7,217	7,073
France.....	102,912	19,804	33,950	42,010	45,010	45,030
Great Britain.....	864	.....	.....	.....	.....	.....
Roumania.....	.....	42,149	40,027	55,652	66,145	62,628
Russia and Siberia.....	1,232,313	958,070	985,154	992,155	1,060,950	1,200,000
Other countries.....	24,290	18,070	17,266	34,016	36,766	36,747
Total Europe.....	1,515,804	1,049,056	1,085,849	1,132,867	1,216,237	1,351,769
AUSTRALASIA—						
New South Wales.....	149,657	18,685	19,422	19,435	18,032	12,831
Queensland.....	265,735	98,841	46,406	10,339	37,979	12,600
South Australia.....	6,556	880	832	758	418	↑
Victoria.....	434,932	67,167	47,296	49,078	38,538	33,917
West Australia.....	1,314,043	485,035	441,252	437,343	408,353	393,405
New Zealand.....	343,595	122,341	114,696	125,777	130,171	118,722
Tasmania.....	33,400	4,625	3,524	4,223	4,861	3,603
Other countries.....	21,393	2,391	5,466	6,541	6,324	55,632
Total Australasia.....	2,569,311	799,965	678,894	653,494	644,676	630,710
ASIA—						
British India.....	589,109	396,349	393,807	383,970	384,268	376,063
China.....	176,999	107,300	107,300	110,000	100,000	100,000
Chosen (Korea).....	173,306	134,128	146,825	190,620	190,000	166,380
British East Indies.....	65,402	24,187	24,187	19,350	19,350	.....
Dutch East Indies.....	163,852	124,388	132,715	115,354	113,071	110,242
Formosa.....	39,406	8,663	9,035	9,035	9,000	14,709
Japan.....	174,846	244,500	272,085	292,533	308,865	334,039
Other countries.....	24,596	16,167	15,205	24,074	20,270	20,050
Total Asia.....	1,407,516	1,055,672	1,101,159	1,144,936	1,144,824	1,121,474
AFRICA—						
Belgian Congo.....	44,334	118,119	122,781	132,201	125,417	138,631
Madagascar.....	60,769	10,802	13,503	9,870	10,352	6,269
Rhodesia.....	690,541	628,974	582,752	594,208	581,790	576,715
British West Africa (b).....	384,836	233,010	199,697	199,666	171,637	180,000
Transvaal, Cape Colony and Natal.....	8,798,713	9,575,040	9,587,592	9,954,762	10,122,491	10,354,264
Other countries.....	45,623	55,323	66,168	62,036	59,964	42,396
Total Africa.....	10,024,816	10,622,168	10,582,493	10,952,743	11,071,621	11,298,275
Grand Total.....	22,145,314	19,050,134	19,031,137	19,369,364	19,506,743	19,727,170

(a) 1913-1925 as reported by the Director of the Mint with some changes. 1926, 1927 and 1928 as compiled by the American Bureau of Metal Statistics. Production of the Philippine Islands is included with the United States. (b) including Gold Coast.

†Included with other countries.

CHAPTER FOUR—THE SILVER MINING INDUSTRY IN CANADA

Including the Silver-Cobalt Mining Industry, the Silver-Lead-Zinc Mining Industry, and Commodity Statistics Tables on Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review.
2. The Silver-Cobalt Mining Industry.
3. The Silver-Lead-Zinc Mining Industry.
4. Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review

(a) *Definition of the Industry.*—Silver mining is not a distinct industry in Canada, as silver is found only in association with other metals; with lead and zinc, particularly, in western Canada, with cobalt in northern Ontario, and with lode and placer gold, copper and other metals in various localities. Industrial reviews concerning the production of silver must therefore consider the various sources of supply, and general statistics on this subject should relate to each of the contributing sections of the mining industry. Silver-lead-zinc mining is a very important industry in British Columbia, the Yukon Territory, Quebec and, to a less extent, in Ontario, whereas the mining of silver-cobalt ores is carried on in Canada only in the province of Ontario. While silver is the predominating metal in some ores of the silver-lead-zinc group there are other mines which yield an ore carrying lead and zinc in greater values, so that the silver content is of secondary importance. Silver values are the governing feature in the silver-cobalt ores of Ontario. Alluvial and lode gold and ores containing copper and gold usually contain commercial values in silver also, but in these ores, the metals, other than silver, are generally of greater importance.

(b) *Historical.*—Silver production in Canada dates back many years, the earliest account being that of the finding of argentiferous-lead on the Quebec side of lake Timiskaming about 1686; it is somewhat remarkable that the Cobalt area lying within a short distance of this property, and one of the richest silver camps in the world, was not found until 1903. In 1868 Thomas McFarlane, working on a rock about 80 or 90 feet in diameter, off Thunder Cape, in lake Superior, discovered a vein containing galena and silver which was afterwards worked as the Silver Islet mine; this property yielded about 3.5 million dollars' worth of silver before it was flooded by the waters of the lake. Then in 1903 the next big find was made. Long lake, later called "Cobalt lake," was the centre of the area which became known as the "Cobalt Silver Camp." This camp and the allied camps of Gowganda and South Lorrain, have been in continuous operation since that time and to the end of 1928 have yielded upwards of 390 million ounces of silver.

In British Columbia the main source of silver for many years was from the silver-lead-zinc ores of the east and west Kootenay districts. These ores were complex and, because of the finely disseminated sulphides, were very hard to treat. The Consolidated Mining and Smelting Company of Trail, B.C., has been the pioneer in Canada in the treatment of these ores. For years the zinc content of British Columbia ores was regarded as detrimental, and treatment of these ores by the smelter could only be carried on profitably by the imposition of penalty charges based on the zinc content. But as the result of an exhaustive research, covering a period of years, a method of concentrating and treatment was evolved whereby the ores could be handled more economically.

In the Yukon, the rich silver-lead ores of the Keno Hill district provide the principal source of the silver production from that section of Canada. Quebec province also, in the last few years, has added its quota in the output of these metals; considerable work is being done on prospects in the Gaspé Peninsula.

Nova Scotia and the prairie provinces have yielded only small quantities of these metals up to the present time, but development and investigational work is being carried on at a zinc property in Cape Breton Island and it is anticipated that Nova Scotia will soon be a contributing factor in Canada's zinc production.

(c) *Sources of Silver, Lead, Zinc, Cobalt and Arsenic.*—Statistics on the production of silver from Canadian ores include (a) silver contained in silver and gold bullion produced, (b) silver contained in blister copper or lead bullion made, and (c) silver estimated as recoverable from ores of all kinds exported for treatment in foreign smelters.

Figures on lead include lead contained in base bullion made at the Trail smelter, lead estimated as recoverable from silver-lead-zinc ores shipped from mines of the Yukon, and from the lead-zinc properties of Quebec, and pig lead made at Galetta in Ontario, with also small quantities of lead contained in silver-lead-bismuth bullion recovered by the smelters treating cobalt ores.

Most of Canada's zinc output is in the form of metallic zinc produced by the Consolidated Mining and Smelting Company at Trail, B.C. The remainder represents zinc estimated as recoverable from ores and residues exported for treatment in foreign smelters.

For the past two decades the ores of the Cobalt district of Ontario have been the main source of the world's supply of cobalt, but in 1928, owing to the production of cobalt by the Union Minière du Haut Katanga, of Central Africa, where it occurs with copper ores, Canada's production was cut to 55 per cent of the world's output.

Arsenic is produced in Canada from the cobalt-silver-nickel-arsenic ores of the Cobalt district by the smelter of the Deloro Smelting and Refining Company Limited, at Deloro, Ontario. Some arsenic is also contained in the concentrates shipped to the Tacoma smelter by the Nickel Plate gold mine of British Columbia, but owing to the low price prevailing during the past two years this company has had little or no return for the arsenic.

(d) *Importance of these Metals.*—Lead production in Canada holds sixth place, silver seventh place, and zinc eleventh place in point of value among the metals and minerals produced. In 1928 Canada ranked third among the world's silver-producing countries; Mexico produced 108.5 million ounces; and the United States 56 million ounces. In the production of lead Canada was surpassed by the United States, Mexico and Australia. In smelter output of zinc, the United States had the highest production of any country, being followed by Belgium, Poland, Germany, France, and Canada in the order named. In the production of cobalt, Canada and Central Africa produced about equal amounts. From 1904 to 1910 the cobalt production figures represent an estimate of the cobalt content of the ores shipped from the mines, a large part of which was not recovered. From 1911 until the present time cobalt production is computed by adding the cobalt content of all cobalt metal oxides and salts sold by the Ontario smelters to the cobalt paid for in ores and residues exported for treatment in foreign smelters, thus representing a true figure of Canada's cobalt production since that time.

Reliable world's figures on the production of arsenic are very difficult to obtain, but the best available information is shown in Table 109. Because of its low price and the instability of demand, smelters operating long distances from the markets do not attempt its complete recovery.

2. The Silver-Cobalt Mining Industry

Mining and milling only are considered in this chapter: smelting of the cobalt ores, in so far as Canadian operations are concerned, is treated in the chapter on "The Non-Ferrous Smelting and Refining Industry."

After the remarkable Silver Islet production, comparatively little silver was produced in Ontario until the discovery of the mineral wealth of the Cobalt area in 1903. From 1905, when the output of silver was over 2,000,000 ounces, the production increased rapidly until the peak year was reached in 1911. In that year Ontario's production of silver was 30,540,754 ounces. In the following year production declined to 29,000,000 ounces and thereafter followed a generally downward trend until 1921, when less than 10,000,000 ounces were reported; in 1928 production in Ontario dropped to 7,242,601 ounces.

Ontario is the only province producing cobalt and refined arsenic. Some of the older properties around Cobalt have been worked out, but new discoveries in South Lorrain, Gowganda and in the old Cobalt camp itself, assist in keeping production fairly constant. The increase in gold production also assists in Ontario's silver output, as the gold from the Porcupine and Kirkland Lake camps carries an average of 16 ounces of silver to every 100 ounces of gold. A small amount of silver is also obtained as a refinery by-product from the nickel-copper ores of the Sudbury district.

In 1928 there were 19 silver-cobalt mines producing, or shipping from old dumps. Of these 14 were operating in the Cobalt area, 3 in South Lorrain and 2 in the Gowganda district. The Nipissing mine was the principal silver producer in this group. Other large mines in order of their production were, O'Brien, Mining Corporation, Castle-Tretheway, Keeley, Miller Lake O'Brien and Frontier Lorrain.

The Nipissing Mining Company, Limited, was the only mining company in Ontario producing refined silver in 1928. Other mines in the district shipped ore to the Nipissing mill, to the mill of the Cobalt Reduction Company, to the Deloro Smelting and Refining Company, and to foreign smelters.

Table 93.—Statistics of Silver-Cobalt Mine and Mill Operations in Canada, 1927 and 1928

	Unit of measure	1927	1928
Number of mines in operation.....		26	19
Ore mined.....	Tons	303,134	260,644
Ores treated.....	Tons	304,534	252,670
Tailings treated.....	Tons	21	
Concentrates produced.....	Tons	5,533	4,649
Quantity of material cyanided.....	Tons	78,838	63,592
Bullion recovered.....	Fine ounces	1,927,529	1,886,958
Bullion recovered by direct smelting.....	Fine ounces	126,462	
Bullion sold.....	Fine ounces	2,040,070	1,815,661
Net value of bullion.....	\$	1,151,544	1,055,485

Table 94.—Shipments of Ores, Concentrates and Residues from the Cobalt Camp, Ontario, 1927 and 1928

Kind	Quantity	Net value (a)	Metallic content paid for		
			Silver	Cobalt	Copper
1927	Tons	\$	fine ounces	lb.	lb.
<i>To Canadian Smelters—</i>					
Ores.....	677	976,040	1,749,680	133,947	
Concentrates and residues.....	3,116	2,199,456	4,123,078	295,463	
<i>To Foreign Smelters—</i>					
Concentrates and residues.....	2,714	433,506	713,010	141,875	40,860
Total.....	6,507	3,609,002	6,585,768	571,285	40,860
1928					
<i>To Canadian Smelters—</i>					
Ores.....	705	544,693	926,596	274,803	
Concentrates.....	2,595	1,894,038	3,486,949	208,826	
<i>To Foreign Smelters—</i>					
Concentrates and residues.....	2,825	444,668	676,907	203,772	44,475
Total.....	6,125	2,883,399	5,090,452	687,401	44,475

(a) Net value is the actual amount received by the operator.

Table 95.—Capital Employed in the Silver-Cobalt Mining Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings and equipment.....	23,815,697	16,765,120
Cost of supplies and stock on hand.....	1,024,241	930,891
Cash, trading and operating accounts and bills receivable.....	5,283,707	4,331,672
Total.....	30,123,645	22,027,683

Table 96.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1927 and 1928

	1927		1928	
	Number	Salaries and wages	Number	Salaries and wages
SALARIED EMPLOYEES—		\$		\$
Total.....	109	285,498	94	246,284
WAGE-EARNERS—				
Surface.....	284	1,892,665	210	1,563,182
Underground.....	860		692	
Mill.....	205		170	
Total.....	1,349	1,892,665	1,072	1,563,182
Total.....	1,458	2,178,163	1,166	1,809,466

Table 97.—Wage-Earners in the Silver-Cobalt Mining Industry in Canada by Months, 1927 and 1928

Month	1927				1928			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	303	904	211	1,418	178	687	172	1,037
February.....	267	870	210	1,347	193	709	175	1,077
March.....	261	888	211	1,360	181	709	163	1,056
April.....	287	869	205	1,361	181	677	167	1,025
May.....	286	849	204	1,339	213	675	164	1,052
June.....	309	861	200	1,370	204	641	160	1,005
July.....	281	814	183	1,278	210	659	163	1,035
August.....	267	789	170	1,226	228	655	159	1,042
September.....	237	758	160	1,155	236	657	162	1,055
October.....	242	774	161	1,177	236	663	161	1,065
November.....	231	751	162	1,144	194	661	157	1,012
December.....	222	720	164	1,106	201	679	155	1,035

3. The Silver-Lead-Zinc Mining Industry

CANADA

Producing, concentrating, smelting and refining of ores of the silver-lead-zinc group is an industry that is fairly well confined to the province of British Columbia; but as already noted there are silver-lead properties in the Yukon, lead at the Galetta property in Ontario and silver-lead-zinc at Notre Dame des Anges in Quebec.

The Consolidated Mining and Smelting Company, Limited, of Trail, B.C., in addition to buying ores and concentrates for the smelter, operates a large customs concentrator which is of great assistance to the smaller mines within a reasonable shipping distance.

QUEBEC

Mining of silver-lead-zinc ores in Quebec is carried on in the vicinity of Notre Dame des Anges where ore was discovered in 1910. Several early attempts to concentrate this ore failed but more recently, as the result of a selective flotation process, worked out by the *Mines Branch*, Ottawa, about the end of 1924, economic recovery of silver-lead-zinc has been successful. During 1928 there were 25,189 tons of lead and zinc concentrates shipped to European smelters.

ONTARIO

Although a small amount of lead is produced from silver-cobalt ores, the greater part of Ontario's lead production is derived from the lead mine at Galetta in Carleton county. The ore of this mine carried no silver and only a small amount of zinc. A separation is made of the zinc and lead concentrates, the zinc concentrates being accumulated for shipment to foreign smelters; the galena is smelted to high-grade pig lead on the property. In 1928 lead concentrates were shipped by the Treadwell Yukon Company. This company operated a pilot mill in connection with investigational work on the copper-lead-zinc ores of the Sudbury district in Ontario.

BRITISH COLUMBIA

In 1928 British Columbia held first place among the silver-producing provinces, and first place among the provinces producing lead and zinc. About 30 per cent of the Dominion total of silver, 94 per cent of the lead, and 89 per cent of the zinc were obtained from the smelting of silver-lead-zinc ores mined in British Columbia. In this province production of these three metals has increased remarkably during the past five years. With the early development of the silver-lead ores of the Kootenays, silver production reached about the 5-million ounce mark in 1897, only to fall away to about 3 million ounces in 1899. Again, in 1901, the 5-million ounce mark was reached but in 1911 production had fallen to less than 2 million ounces. From that time forward, the output increased; first, through the demand created by the war, and later as a result of the development of the Premier mine in northern British Columbia.

Application of flotation methods in the treatment of silver-lead-zinc ores enabled producers to increase their mine outputs. Another factor contributing to the growth was the rise in the prices of lead and zinc and the maintenance until the last two years of these prices at generally high levels. Increased production of the famous Sullivan lead and zinc mine also added appreciably to the silver output; indeed, this mine though nominally a lead-zinc property was, in 1928, the largest silver producing mine in Canada.

The Trail smelter buys silver-lead-zinc ores, but much silver and some lead are also contained in ores exported by the mines on the coast; most of these ores are mined primarily for their copper and gold values, but the other associated metals, including silver, are recovered in the smelting process.

YUKON

In the Yukon the Keno Hill district is the principal producer of silver and lead. According to a report given to the *Mining Lands Branch* of the Department of the Interior by the Gold Commissioner of the Yukon, it has been shown that ore values continue with depth. In 1928 twelve mines were reported as having shipped ores and concentrates. The Treadwell-Yukon Company, the largest producer in the district, completed a concentrator in the summer of 1925 that has worked to full capacity since it was built. Ores from neighbouring mines are treated in the mill, and this feature is much appreciated by the smaller operators who have thus been able to continue development work with the proceeds from the sales of their ores.

Table 98.—Shipments of Lead Ores and Concentrates from Canadian Mines, 1913-1928

Year	Shipment		Lead content in pounds	Silver content in ounces
	Tons	Value		
		\$		
1913.....	85,978	3,276,812	53,807,570	2,564,155
1914.....	70,207	2,652,802	50,527,130	2,501,820
1915.....	73,762	2,953,394	48,708,005	2,954,175
1916.....	84,516	4,568,500	54,124,628	2,582,952
1917.....	46,799	3,866,862	38,696,116	1,670,064
1918.....	76,256	4,705,573	46,843,602	2,314,542
1919.....	54,508	3,044,839	32,147,989	2,185,376
1920.....	69,493	2,985,848	36,325,507	2,882,178
1921.....	15,259	671,313	9,517,616	989,374
1922.....	27,203	1,803,575	21,335,850	2,163,637
1923.....	76,886	4,692,755	66,770,926	3,745,129
1924.....	153,396	12,200,699	180,187,114	4,348,243
1925.....	208,588	15,420,756	237,675,311	6,024,213
1926.....	255,048	17,546,728	273,963,827	8,616,164
1927.....	275,328	13,044,514	308,903,620	8,831,840
1928.....	255,944	12,178,879	322,239,859	10,287,591

Table 99.—Shipments of Zinc Ores and Concentrates from Canadian Mines, 1898-1928

Year	Shipments		Metallic zinc shipped Pounds	Year	Shipments		Metallic zinc shipped Pounds
	Tons	Value \$			Tons	Value \$	
1898.....	1,162	11,000	788,000	1913.....	7,889	186,827	7,069,800
1899.....	865	18,165	814,000	1914.....	10,893	262,563	9,101,460
1900.....	261	4,810	212,000	1915.....	14,895	554,938	12,231,439
1901*.....				1916.....	82,077	1,086,249	48,498,078
1902.....	158	1,659	142,200	1917.....	116,489	1,323,985	64,655,713
1903.....	1,000	10,500	900,000	1918.....	121,200	1,228,195	63,026,464
1904.....	597	3,700	477,568	1919.....	135,535	1,049,493	59,959,709
1905.....	9,413	139,200	*	1920.....	249,136	1,157,844	91,033,202
1906.....	1,154	23,800	*	1921.....	297,406	1,498,716	98,799,093
1907.....	1,573	49,100	*	1922.....	356,096	2,357,849	102,975,964
1908.....	452	3,215	*	1923.....	279,229	1,853,114	96,148,734
1909†.....	18,371	242,699	16,468,204	1924.....	191,369	4,310,271	129,643,631
1910.....	5,063	120,003	4,361,712	1925.....	173,172	6,481,930	153,980,628
1911.....	2,590	101,072	2,346,849	1926.....	242,967	8,643,306	188,393,028
1912.....	6,415	215,149	5,354,700	1927.....	204,828	4,383,586	196,210,320
				1928.....	810,255	4,715,452	250,476,679

* Figures not available. † Includes 7,424 tons shipped late in 1908.

Table 100.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry, in Canada, 1927 and 1928

Production	Quebec and Ontario	British Columbia	Yukon	Canada
1927	Tons	Tons	Tons	Tons
Ore mined.....	307,771	1,390,311	65,578	1,763,660
Ore milled.....	329,324	1,520,677	64,100	1,914,101
Concentrates produced—lead.....	11,721	192,626	5,491	209,838
Concentrates produced—zinc.....	21,844	180,989	.....	202,833
1928				
Ore mined.....	320,230	1,729,883	47,066	2,097,179
Ore milled.....	324,290	1,840,252	44,492	2,209,034
Concentrates produced—lead.....	11,304	210,461	4,876	226,641
Concentrates produced—zinc.....	27,933	213,856	.....	241,789
Concentrates produced—copper.....	716	.....	.....	716

Table 101.—Products Shipped by Silver-Lead-Zinc Mines in Canada, 1927 and 1928

Location of mines	No. of mines shipping	Products shipped	Quantity shipped	Net value at shipping point	Total metal content as determined by settlement assay				
					Gold	Silver	Lead	Zinc	Copper
Canada			Tons	\$	Oz.	Oz.	Lb.	Lb.	Lb.
1927									
Quebec and Ontario.	2	Lead ore							
		Lead concentrates..	11,874	1,071,662	5,756	626,174	15,203,195	958,334	
		Zinc concentrates...	21,839	731,500	2,788	176,433	305,701	21,486,307	
		Total.....	33,713	1,803,162	8,544	802,607	15,508,896	22,444,641	
British Columbia...	110	Lead ore.....	66,692	1,515,119	6,367	1,402,756	25,366,010	10,581,238	
		Lead concentrates..	192,674	9,513,937	5,812	5,087,432	263,759,738	18,140,044	
		Zinc ore.....	1,861	48,367	140	93,534	196,099	495,808	
		Zinc concentrates...	181,123	3,603,719	382	459,765	11,290,986	174,228,205	
		Dry ore.....	10,637	79,278	1,101	83,410	323,730	473,061	
		Total.....	452,987	14,760,420	13,802	7,126,897	300,936,563	203,918,356	
Yukon.....	17	Lead ore.....	1,402	175,816	21	224,506	1,681,279		
		Lead concentrates..	2,686	767,980	143	1,490,972	2,893,398		
		Dry ore.....	58	12,752		19,691	72,676		
		Total.....	4,146	956,548	164	1,735,169	4,647,353		
Canada.....	129		490,846	17,520,130	22,510	9,664,673	321,092,812	226,362,997	
1928									
Quebec and Ontario.	3	Lead ore.....							
		Lead concentrates..	11,301	880,729	4,939	622,889	13,315,520	715,804	
		Zinc concentrates...	25,266	837,703	2,319	155,455	201,510	25,159,052	
		Copper concentrates	716	17,570	122	7,045		180,546	
		Total.....	37,283	1,736,002	7,380	785,389	13,517,030	25,874,856	180,546
British Columbia...	86	Lead ore.....	27,130	618,812	1,477	838,745	13,341,062	2,379,353	
		Lead concentrates..	211,024	9,119,639	1,252	6,055,889	288,366,137	19,734,841	
		Zinc ore.....	70,291	79,653	7	118,459	10,867,555	17,740,782	
		Zinc concentrates...	214,698	3,798,096	398	674,115	14,434,944	207,576,845	
		Dry ore.....	19,009	148,554	1,111	301,793	64,392	80	
		Total.....	542,152	13,764,754	4,245	7,989,001	327,074,090	247,431,001	
Yukon.....	12	Lead ore.....	2,914	543,411	197	925,752	3,258,037		1,346
		Lead concentrates..	3,575	1,016,288	51	1,844,316	3,959,103		83,002
		Dry ore.....	297	63,000		127,825	437,556		
		Total.....	6,786	1,622,699	248	2,897,893	7,654,696		84,348
Canada.....	101		586,221	17,123,455	11,873	11,672,233	348,245,816	273,306,757	264,894

Table 102.—Destination of Shipments from Silver-Lead-Zinc Mines in Canada, 1927 and 1928

Product shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assay				
			Gold	Silver	Lead	Zinc	Copper
1927		\$	Oz.	Oz.	Lb.	Lb.	Lb.
<i>To Canadian Smelters—</i>							
Lead ore.....	66,639	1,513,804	6,362	1,398,643	25,352,408	10,581,238	
Lead concentrates.....	195,255	9,728,897	1,007	4,979,854	270,377,177	18,140,044	
Zinc ore.....	1,861	48,367	140	93,534	196,099	495,808	
Zinc concentrates.....	178,713	3,559,187	382	459,765	11,290,986	171,865,106	
Dry ore.....	10,623	78,248	1,100	80,488	321,543	473,061	
Total.....	453,091	14,928,503	8,991	7,012,284	307,538,213	201,555,257	
<i>To Foreign Smelters—</i>							
Lead ore.....	1,455	177,131	26	228,619	1,694,881		
Lead concentrates.....	11,979	1,624,682	10,704	2,224,724	11,479,154	958,334	
Zinc ore.....				176,433	308,701	23,849,406	
Zinc concentrates.....	24,249	776,032	2,788				
Dry ore.....	72	13,782	1	22,613	74,863		
Total.....	37,755	2,591,627	13,519	2,652,389	13,554,599	24,807,740	
1928							
<i>To Canadian Smelters—</i>							
Lead ore.....	26,975	607,787	1,477	818,003	13,317,453	2,379,353	
Lead concentrates.....	215,431	9,382,935	1,252	6,055,889	294,948,527	19,734,841	
Zinc ore.....	70,291	79,653	7	118,459	10,867,555	17,740,782	
Zinc concentrates.....	214,735	3,799,758	400	674,239	14,434,944	207,612,371	
Dry ore.....	19,009	148,554	1,111	301,793	64,392	80	
Total.....	546,441	14,018,687	4,247	7,968,383	333,632,871	247,467,427	
<i>To Foreign Smelters—</i>							
Lead ore.....	3,069	554,436	197	946,494	3,281,646		1,346
Lead concentrates.....	10,469	1,633,721	4,990	2,467,205	10,692,233	715,804	83,002
Zinc ore.....							
Zinc concentrates.....	25,229	836,041	2,317	155,381	201,510	25,123,526	
Dry ore.....	297	63,000		127,825	437,556		
Copper concentrates.....	716	17,570	122	7,045			180,546
Total.....	39,789	3,104,768	7,626	3,793,900	14,612,945	25,839,330	264,894

Table 103.—Capital Employed in the Silver-Lead-Zinc Mining Industry in Canada, 1927 and 1928

Province	Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
1927	\$	\$	\$	\$
Quebec.....	2,953,469	74,192	873,979	3,901,640
Ontario.....	3,012,320	295,303	393,837	3,701,460
British Columbia.....	13,249,200	951,370	4,013,926	18,214,496
Yukon.....	1,370,100	691,639	157,025	2,218,764
Canada.....	20,585,089	2,012,474	5,438,767	28,036,330
1928				
Nova Scotia and Quebec.....	1,211,695	60,167	812,285	2,134,147
Ontario.....	4,701,936	175,412	405,505	5,282,903
British Columbia.....	25,651,196	1,200,823	639,221	27,554,240
Yukon.....	2,782,769	795,940	343,893	3,923,602
Canada.....	34,350,646	2,293,342	2,250,904	38,894,892

Table 104.—Employees, Salaries and Wages in the Silver-Lead-Zinc Mining Industry in Canada, 1927 and 1928

Province	1927						1928					
	On salary	Mine		Mill	Total	Salaries and wages	On salary	Mine		Mill	Total	Salaries and wages
		Surface	Under-ground					Surface	Under-ground			
Nova Scotia and Quebec.....	21	146	151	30	348	\$ 348,904	18	122	143	21	304	\$ 754,378
Ontario.....	49	155	233	21	458	659,419	48	221	311	31	611	624,338
British Columbia.....	149	628	933	446	2,156	3,420,497	222	849	1,032	475	2,578	4,116,029
Yukon.....	10	45	78	11	144	378,997	14	76	86	11	187	436,889
Canada.....	229	974	1,395	508	3,106	4,807,817	302	1,268	1,572	538	3,680	5,531,634

Table 105.—Wage-Earners in the Silver-Lead-Zinc Mining Industry in Canada, by Months, 1927 and 1928

Month	1927				1928			
	Surface	Under-ground	Mill	Total	Surface	Under-ground	Mill	Total
January.....	619	1,184	433	2,236	792	1,322	433	2,547
February.....	668	1,216	413	2,297	859	1,311	433	2,603
March.....	766	1,279	420	2,465	922	1,365	439	2,726
April.....	848	1,282	434	2,564	955	1,434	458	2,847
May.....	821	1,289	466	2,576	1,135	1,429	496	3,060
June.....	905	1,309	498	2,712	1,181	1,439	517	3,137
July.....	983	1,347	525	2,855	1,324	1,474	530	3,328
August.....	1,011	1,366	527	2,904	1,409	1,446	542	3,397
September.....	1,020	1,361	554	2,935	1,410	1,471	545	3,426
October.....	1,100	1,375	562	3,037	1,385	1,563	577	3,525
November.....	1,008	1,341	500	2,849	1,240	1,492	554	3,286
December.....	783	1,308	439	2,530	1,034	1,487	545	3,066

4.—Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

ARSENIC

The greater part of the Canadian production of arsenic is obtained from the south Ontario smelters as a by-product from the treatment of ores mined in the Cobalt district. A small amount is also contained in residues exported from these smelters. British Columbia's annual production of arsenic is contained in concentrates shipped from the Nickel Plate gold mine to the Tacoma smelter for further treatment.

Arsenic is used mainly in the manufacture of insecticides, for which the principal market is found in the cotton-growing areas of the southern United States where it is largely used in the control of the boll-weevil, an insect which is very destructive to the southern cotton crop. The glass and tanning industries also consume considerable quantities of white arsenic.

Table 106.—Production of Arsenic in Canada, 1885-1928

Year	White Arsenic		Year	Arsenic in Ore*		White Arsenic	
	Tons	Value		Tons	Value	Tons	Value
		\$			\$		\$
1885.....	440	17,600	1907.....	656	11,094	330	36,209
1886.....	120	5,460	1908.....	986	17,506	716	41,060
1887.....	30	1,200	1909.....	224	3,346	1,129	64,100
1888.....	30	1,200	1910.....	547	5,716	1,502	75,328
1889.....			1911.....			2,097	76,237
1890.....	25	1,500	1912.....			2,045	89,262
1891.....	20	1,000	1913.....			1,692	101,463
1892-3.....			1914.....			1,737	104,015
1894.....	7	420	1915.....			2,396	147,830
1895-8.....			1916.....			2,186	262,349
1899.....	57	4,872	1917.....	280	11,200	2,656	658,231
1900.....	303	22,725	1918.....	1,078	43,114	2,482	520,525
1901.....	695	41,676	1919.....	530	21,218	2,859	498,706
1902.....	800	48,000	1920.....	628	22,231	1,831	425,617
1903.....	257	15,420	1921.....			1,491	233,763
1904-5.....			1922.....	518	21,097	2,058	299,940
1906.....	201	14,058	1923.....	631	44,030	2,579	582,785
			1924.....	513	39,185	1,798	309,108
			1925.....	714	21,513	1,003	108,789
			1926.....	545	12,687	1,992	134,124
			1927.....	667	15,644	2,447	196,335
			1928.....	708	16,539	2,008	176,513
			Total.....	9,225	306,120	44,019	5,307,420

* Computed as As₂O₃: net value as reported by the operators.Table 107.—Production, Exports and Imports of Arsenic, (As₂O₃), for Canada, 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
PRODUCTION—						
From arsenical concentrates exported.. lb.	1,090,460	12,687	1,333,421	15,644	1,416,805	16,539
White arsenic..... lb.	3,984,217	134,124	4,894,547	196,335	4,015,418	176,513
Total..... lb.	5,074,677	146,811	6,227,968	211,979	5,432,223	193,052
EXPORTS—						
Arsenic, As ₂ O ₃ lb.	3,344,000	103,120	3,856,600	124,823	3,191,900	122,106
IMPORTS—						
White arsenic..... lb.	144,031	5,604	286,377	11,833	333,113	13,976
Sulphide of arsenic..... lb.	68,829	3,136	16,245	1,593	94,380	5,565
Arseniate of soda..... lb.	15,357	3,151	25,148	4,024	360	83

Table 108.—Monthly Average Prices of Arsenic, 1926-1928

(From Engineering and Mining Journal)

Month	New York, in cents per pound		
	1926	1927	1928
January.....	3-00	3-50	4-00
February.....	3-25	3-75	4-00
March.....	3-25	3-75	4-00
April.....	3-25	3-75	4-00
May.....	3-50	3-75	4-00
June.....	3-50	3-75	4-00
July.....	3-50	3-75	4-00
August.....	3-50	3-75	4-00
September.....	3-50	4-00	4-00
October.....	3-50	4-00	4-00
November.....	3-50	4-00	4-00
December.....	3-50	4-00	4-00
Average.....	3-40	3-83	4-00

Table 109—World Production of Arsenic Ore and White Arsenic
1922-1927, in metric tons.

(Compiled by L. M. Jones, of the Bureau of Mines Washington, D.C., U.S.A.)

Country and product	1922	1923	1924	1925	1926	1927
Algeria:						
Arsenate of lead—						
Gross weight.....	160	2,270	9,335	6,750	3,665	2,482
Arsenic content.....	34	409	1,587	1,215	733	546
Australia:						
New South Wales—						
Ore and concentrates.....	1	11,677	4,487	3,400	21,796	755
White arsenic.....	296	367	323	301	202	1
Queensland—						
Ore.....	1	1	1	1,133	828	71
White arsenic.....	406	620	573			
South Australia—						
Ore—						
Gross weight.....			69	102		
Arsenic content.....			1	1		
Victoria—						
White arsenic.....	1	1,036	437	1	1	1
Western Australia—						
Ore ^{2,3}						
Gross weight.....	1,092					
Arsenic content.....	1					
Austria:						
Ore ^{3,4}						
Gross weight.....			560	89		
Arsenic content.....			40	15		
Arsenic content of gold ores.....	103	136	216	237	155	14
Belgium:						
White arsenic.....	1,008	1,380	1,850	1	1	1
Brazil:						
White arsenic.....	154	162	146	1	51	1
Canada:						
White arsenic.....	1,867	2,340	1,631	910	1,807	2,220
Arsenic content of ores and concentrates ^{2,3}	470	572	465	648	495	605
China:						
Ore ^{2,3}	549	413	472	395	1	1
White arsenic ^{2,3}	30	176	237	94	1	1
Chosen:						
Ore.....	56	26		1		
White arsenic.....	1	95		2,3107		
Czechoslovakia:						
Ore—						
Gross weight.....	1	24	217	34	4	13
Arsenic content.....	1	1	1	1	1	3
France:						
Ore.....	4,465	10,022	14,029	30,349	23,256	55,800
White arsenic.....	266	815	802	2,217	2,096	1
Germany:						
Ore and concentrates ⁵ —						
Gross weight.....	8,750	10,273	10,818	6,626	3,930	4,710
Arsenic content.....	2,958	3,363	3,499	2,085	1,353	1,639
Great Britain:						
Ore.....	360	741	304	11		81
White arsenic and arsenic soot.....	994	1,631	3,253	2,586	1,693	1,358
Greece:						
White arsenic.....	967	1,176	1,096	423	1,148	1,036
Italy:						
Ore—						
Gross weight.....	450	206	147	4	200	81
Arsenic content.....	81	46	33	1	35	20
Japan:						
Ore.....	2,295	64,245	7,416	1	1	1
White arsenic.....	1,022	4,287	3,703	3,485	1,035	1,713
Mexico:						
White arsenic.....	7272	1,402	2,551	7,507	6,458	9,018
Norway:						
Ore—						
Gross weight.....		577				
Arsenic content.....		149				
Peru:						
Ore.....	1	232		1		
Arsenic.....	1	6115		119		
Portugal:						
Ore.....	106	160	279	76	7	47
White arsenic.....	604	887	874	1,092	354	1
Rhodesia, Southern:						
Ore—						
Gross weight.....	451	774	533	170	49	38
Arsenic content.....	1	1	1	1	1	1
Spain:						
Ore—						
Gross weight.....					190	186
Arsenic content.....					29	28

Table 109.—World Production of Arsenic Ore and White Arsenic, 1922-1927, in metric tons—Concluded

Country and product	1922	1923	1924	1925	1926	1927
Sweden:						
Ore—						
Gross weight.....			80	110	13,149	22,100
Arsenic content.....			19	21	2,478	4,420
Switzerland:						
Ore—						
Gross weight.....	10	100	1	1	1	
Arsenic content.....	1	1	1	1	1	
Turkey:						
Ore—						
Gross weight.....	1200	1	1	1	1	
Arsenic content.....	1	1	1	1	1	
Union of South Africa:						
White arsenic.....	3	5	102	33	38	53
United States:						
White arsenic.....	9,096	12,946	13,111	11,174	10,709	10,487

¹Data not available.²Exclusive of output of Ottery Mine, for which data are not available.³Exports.⁴Exclusive of arsenical gold ores worked primarily for their gold and silver content.⁵Data relate to concentrates produced and ore sold without concentration.⁶Incomplete figures, output of principal mines only.⁷Figures of Mexican Government. The Penoles Co. reports 335 tons shipped.⁸Content of ore.⁹White arsenic exported by the Anglo-French Ticapampa Silver Mining Co. (Ltd.)¹⁰Year ended Oct. 31.¹¹Production reported, but figures not available for publication.

COBALT

Production figures for Canada include the cobalt content of the various cobalt products sold by the south Ontario smelters and the cobalt content of the ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

During 1926, 1927 and 1928, Canada's production of cobalt decreased sharply in contrast to the totals for earlier years. This was due largely to new competition in the world's markets arising from the development of properties in Central Africa by the Union Miniere du Haut Katanga. Cobalt from this source, computed in terms of the cobalt content of metal, oxides and salts marketed during the year amounted in 1927 to 784,000 pounds as compared with 672,000 pounds in 1926.

Since the discovery of the Cobalt camp in 1903, by far the greater part of the world's supply of cobalt has been derived from the treatment of ores mined in that area. Two companies, the Coniagas Reduction Company of Thorold, Ontario, (closed down in 1926) and the Deloro Smelting and Refining Company, Limited, at Deloro, Ontario, developed processes for the recovery of cobalt from these ores. A brief outline of the process follows:—

Reduction of the ore in a blast furnace produces a speiss containing silver, cobalt, nickel, a small amount of iron and other metals. The speiss is roasted to free it from arsenic; then chloridized and leached with sulphuric acid to extract the copper, and cyanided to dissolve the silver. Silver in the cyanide solution is precipitated by means of aluminium dust. The "speiss residues" remaining are treated for the recovery of cobalt and nickel in the form of oxides. In some cases the speiss residues are exported.

Cobalt oxide is marketed either as black or gray oxide; the black oxide contains about 70 per cent cobalt metal and the gray, about 75 per cent cobalt metal. Gray oxide is made by giving the black oxide a slight roast in a reducing atmosphere in a reverberatory furnace. Cobalt salts of various kinds are also made, and if the pure metal is required, the black oxide is reduced in the reverberatory furnace using charcoal as the reducing agent.

The market for cobalt which was very poor in 1915 gradually improved during the war. No quotations on the New York market were available during 1918, 1919 and 1920. During 1921 the quotations given in the *Engineering and Mining Journal* ranged from \$3 to \$3.50 per pound; the former value was used in computing the annual production values. In 1922 the average price \$3.25 per pound, was used. In 1923, the quotation, \$2.85 was used, but from 1924 to date the values given in the report have been based on the returns actually received by the operators for the products sold. In 1928 the market quotations for cobalt were: metal, \$2.50 per pound; cobalt oxide, \$2.10 per pound.

Under the provisions of the *Metal Refining Bounty Act*, passed by the Ontario Legislature in 1907, bounties were paid to refineries amounting to \$126,987.08 on cobalt metal, cobalt oxide, and salts of cobalt, and \$43,153.85 on nickel oxide, and salts of nickel, or a total for both cobalt and nickel of \$170,140.93. The quantities produced and the bounties paid each year are given in detail in the annual *Reports of the Ontario Bureau of Mines*.

The bounty was at the rate of 6 cents per pound on the metallic content of the oxides. The Act which expired in April 1917, was not re-enacted.

An historical summary of the production in Canada which dates from the year 1904 is shown in the following table. For the years 1904 to 1910 inclusive, the figures given were prepared by the Ontario Bureau of Mines, and represent the estimated cobalt content of the ores shipped from the mines. From 1911 to date, the quantities given are the cobalt content of all smelter products sold or shipped, such as cobalt metal, the oxides, mixed oxides and residues, etc.

Table 110.—*Production of Cobalt from Canadian Ores, 1904-1928

Year	Pounds	Year	Pounds	Year	Pounds
1904.....	32,000	1913.....	865,937	1922.....	616,088
1905.....	236,000	1914.....	871,891	1923.....	760,105
		1915.....	504,212	1924.....	948,704
1906.....	642,000			1925.....	1,116,492
1907.....	1,478,000	1916.....	840,536		
1908.....	2,448,000	1917.....	1,079,572	1926.....	664,778
1909.....	3,066,000	1918.....	737,157	1927.....	880,590
1910.....	2,196,000	1919.....	530,371	1928.....	956,590
		1920.....	546,023		
1911.....	1,704,000			Total.....	24,636,125
1912.....	663,093	1921.....	251,986		

*See preceding paragraph.

Table 111.—Production in Canada and Exports of Cobalt, 1926-1928

	1926		1927		1928	
	Pounds	\$	Pounds	\$	Pounds	\$
PRODUCTION—						
Cobalt, computed as cobalt in metal, oxides and salts sold, and in ores and residues exported.....	664,778	1,136,014	880,590	1,764,534	956,590	1,672,320
EXPORTS—						
Cobalt alloys, cobalt metallics, cobalt oxides, cobalt salts and cobalt ores.....		1,064,276		1,678,468		1,734,461

Table 112.—Imports of Cobalt into the United States, 1919-1928

(From *The Mineral Industry*, 1928)

Year	Ore		Cobalt		Zaffer		Oxide	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$		\$
1919.....	17,045	2,832	60,511	141,450			131,424	184,751
1920.....	13,039	4,794	143,603	326,864	220	14	202,724	399,605
1921.....	7,657	3,235	38,442	105,539			164,003	342,426
1922.....	5,195	7,075	126,364	321,396			217,530	435,895
1923.....	58,719	56,326	225,639	552,434			258,574	511,903
1924.....	28,786	37,276	118,952	264,935			226,703	440,898
1925.....	34,782	31,320	198,669	422,185			287,265	546,292
1926.....	154,468	55,820	387,076	820,873	110	40	333,132	632,478
1927.....	0,382	3,019	407,198	841,442			369,747	703,608
1928.....			(a) 643,315	1,173,496			364,154	692,753

(a) Ore and metal.

Table 113.—World Production of Cobalt, 1924-1928

(Pounds)

	1924	1925	1926	1927	1928
BRITISH EMPIRE					
Canada (a).....	948,752	1,116,528	664,832	880,544	962,640
Australia (b).....	441,840	201,600	60,480	(c)	17,360
FOREIGN COUNTRIES					
Belgian Congo.....	612,080	428,400	792,960	795,960	896,000
Chile.....	76,272	(c)	2,240	784	(c)
Germany (Saxony).....	13,440	15,456	(c)	3,094	(c)

(a) Metal recovered from smelter products, including cobalt contained in cobalt residues exported.

(b) Metal content of concentrates.

(c) Information not available.

SILVER

CANADA

Production—SPECIAL NOTE.—Prior to 1922, the method used in compiling the statistics on the silver production of Canada was to include, except for Ontario, the quantities of silver produced from Canadian ores either in Canadian or foreign smelters. For Ontario, the sales of silver bullion from the mines and smelters were considered as the year's production. In order to bring the practice for Ontario into harmony with that used in computing the silver output for the other provinces, adjustments amounting to 1,222,450 ounces were made for 1922 to take account of the stocks of silver bullion on hand at the end of 1921 which had not been previously included in the reports on the mineral production of Canada.

Table 114.—Production of Silver in Canada, by Provinces and by Sources, 1927 and 1928

	1927		1928	
	Quantity	Value	Quantity	Value
	Fine ounces	\$	Fine ounces	\$
NOVA SCOTIA—				
In gold bullion.....	125	70	77	45
QUEBEC—				
In gold ores, in blister copper and in copper ores and in silver-lead-zinc ores exported.....	740,864	417,625	908,959	528,793
ONTARIO—				
In silver bullion and nuggets.....	8,108,026	4,570,494	5,954,880	3,464,311
In gold bullion.....	266,946	150,477	242,468	141,058
In slags exported from gold mines.....	5,077	2,862	5,759	3,350
In matte, blister copper and in ores, concentrates and residues exported.....	927,904	523,060	1,039,494	604,737
Total.....	9,307,953	5,246,893	7,242,601	4,213,456
MANITOBA—				
In gold bullion.....	12	7	1,763	1,026
ALBERTA—				
In gold bullion.....	4	3	7	4
BRITISH COLUMBIA—				
In alluvial gold.....	1,654	932	1,516	882
In gold bullion.....	2,452	1,382	1,536	894
In blister copper.....	964,747	543,828	770,557	448,279
In base bullion and in ores exported.....	10,071,592	5,677,357	10,169,758	5,916,358
Total.....	11,040,445	6,223,499	10,943,367	6,366,413
YUKON—				
In alluvial gold.....	6,925	3,904	7,676	4,466
In ores exported.....	1,640,370	924,676	2,831,951	1,647,519
Total.....	1,647,295	928,580	2,839,633	1,651,985
Canada.....	22,736,698	12,816,677	21,936,407	12,761,725

Table 115.—Production of Silver in Canada, 1887-1928

Year	Fine ounces	Value	Cents per ounce	Year	Fine ounces	Value	Cents per ounce
		\$				\$	
1887.....	355,083	347,271	98-00	1909.....	27,529,473	14,178,504	51-50
1888.....	437,232	410,998	94-00	1910.....	32,869,264	17,580,455	53-49
1889.....	383,318	353,785	93-60	1911.....	32,559,044	17,355,272	53-30
1890.....	400,687	419,118	104-60	1912.....	31,955,560	19,440,165	60-83
1891.....	414,523	409,549	98-00	1913.....	31,845,803	19,040,924	59-79
1892.....	310,651	272,130	86-00	1914.....	28,449,821	15,593,631	54-81
1893.....	428,738	330,128	77-00	1915.....	26,625,960	13,228,842	49-68
1894.....	847,697	534,049	63-00	1916.....	25,459,741	16,717,121	65-66
1895.....	1,578,275	1,030,299	65-28	1917.....	22,221,274	18,091,895	81-417
1896.....	3,205,343	2,149,503	67-06	1918.....	21,333,979	20,693,704	96-772
1897.....	5,558,446	3,323,395	59-79	1919.....	16,020,657	17,802,474	111-122
1898.....	4,452,333	2,593,929	58-26	1920.....	13,330,357	13,450,330	100-900
1899.....	3,411,644	2,032,658	59-58	1921.....	13,543,198	8,485,355	62-654
1900.....	4,468,225	2,740,362	61-33	1922.....	18,636,439	12,576,758	67-521
1901.....	5,539,192	3,265,354	58-95	1923.....	18,601,744	12,067,500	64-873
1902.....	4,291,317	2,238,351	52-16	1924.....	19,736,323	13,180,113	66-781
1903.....	3,198,581	1,709,642	53-45	1925.....	20,228,988	13,971,150	69-065
1904.....	3,577,526	2,047,095	57-22	1926.....	22,371,924	13,894,531	62-107
1905.....	6,000,023	3,621,133	60-35	1927.....	22,736,698	12,816,677	56-370
1906.....	5,473,379	5,659,455	66-79	1928.....	21,636,407	12,761,725	58-176
1907.....	12,779,799	8,348,659	65-33	Total.....	560,250,899	353,415,237	.....
1908.....	22,106,233	11,686,239	52-36				

Table 116.—Production of Silver from Canadian Ores,* by Provinces, 1887-1928

Year	Quebec		Ontario		British Columbia		Yukon Territory	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$		\$
1887.....	146,898	143,666	190,495	186,304	17,690	17,301		
1888.....	149,388	140,425	208,064	195,530	79,780	74,993		
1889.....	148,517	139,012	181,609	169,986	53,192	49,787		
1890.....	171,545	179,436	158,715	166,066	70,427	73,666		
1891.....	185,584	183,357	225,633	222,926	3,306	3,266		
1892.....	191,910	168,113	41,581	36,425	77,160	67,592		
1893.....		126,439		8,689		195,000		
1894.....	101,318	63,830			746,379	470,219		
1895.....	81,753	53,369			1,496,522	976,930		
1896.....	70,000	46,942			3,135,343	2,102,561		
1897.....	80,475	48,116	5,000	2,990	5,472,971	3,272,289		
1898.....	74,932	43,655	85,000	49,521	4,292,401	2,500,753		
1899.....	40,231	20,900	202,000	120,352	2,939,413	1,751,302	230,000	137,034
1900.....	58,400	35,817	161,650	99,140	3,968,175	2,427,548	290,000	177,857
1901.....	41,459	24,440	151,400	89,250	5,151,333	3,036,711	195,000	114,953
1902.....	42,500	22,168	145,000	75,632	3,917,917	2,043,586	185,900	96,985
1903.....	28,600	15,287	17,777	9,502	2,996,204	1,601,471	155,000	83,362
1904.....	15,000	8,538	206,875	118,376	3,222,481	1,843,935	133,170	76,201
1905.....	19,620	11,841	2,451,356	1,479,442	3,439,417	2,075,757	89,630	54,093
1906.....	17,686	11,813	5,401,766	3,607,894	2,990,262	1,997,226	63,665	42,522
1907.....	16,000	10,452	9,982,363	6,521,178	2,745,448	1,793,519	35,988	23,510
1908.....	13,299	7,030	19,398,545	10,254,847	2,631,389	1,391,058	63,000	33,304
1909.....	13,233	6,815	24,822,099	12,784,126	2,649,141	1,364,387	45,000	23,176
1910.....	7,593	4,061	30,366,366	16,241,755	2,407,837	1,287,883	87,418	46,756
1911.....	18,435	9,827	30,540,754	16,279,443	1,887,147	1,005,924	112,708	60,078
1912.....	9,465	5,758	29,214,025	17,772,352	2,651,002	1,612,737	81,068	49,318
1913.....	34,573	20,672	28,411,261	16,987,377	3,312,343	1,980,483	87,626	52,392
1914.....	57,737	31,646	25,139,214	13,779,055	3,159,897	1,731,971	92,973	50,959
1915.....	63,450	31,524	22,748,609	11,302,419	3,565,852	1,771,658	248,049	123,241
1916.....	98,610	64,748	21,608,158	14,188,133	3,392,872	2,227,794	360,101	236,446
1917.....	136,194	110,885	19,301,835	15,714,975	2,655,994	2,162,430	119,605	97,379
1918.....	178,675	172,907	17,198,737	16,643,562	3,921,336	3,794,755	71,915	69,594
1919.....	140,926	156,600	12,117,878	13,465,628	3,713,537	4,126,556	27,556	30,621
1920.....	61,003	61,552	9,907,626	9,996,795	3,327,028	3,356,971	19,190	19,363
1921.....	38,084	23,861	9,761,607	6,116,037	3,350,357	2,099,133	393,092	246,288
1922.....			10,811,903	7,300,305	7,150,937	4,828,384	663,493	447,997
1923.....	33,006	21,412	10,540,943	6,838,236	6,113,327	3,965,899	1,914,438	1,241,953
1924.....	83,814	55,972	11,272,567	7,527,933	8,153,003	5,444,657	226,755	151,429
1925.....	214,943	148,451	10,529,131	7,271,944	8,579,458	5,925,403	904,893	624,964
1926.....	375,986	233,513	9,274,965	5,760,402	10,625,816	6,599,376	2,095,027	1,301,159
1927.....	740,864	417,625	9,307,953	5,246,893	11,040,445	6,223,499	1,647,295	928,580
1928.....	908,959	528,796	7,242,601	4,213,456	10,943,267	6,366,413	2,839,633	1,651,985
Total.....	4,910,665	3,611,386	389,333,061	248,844,916	152,037,956	97,642,783	13,480,188	8,293,499

*Does not include small productions from Nova Scotia, New Brunswick, Alberta and Manitoba.

ONTARIO

Table 117.—Silver in Mine Shipments from Cobalt District and Nearby Camps in Ontario, 1904-1928

From 1928 *Report of Ontario Department of Mines.*

Year	Silver shipments in Troy ounces				
	Cobalt area	Casey township	South Lorrain	Gowganda	Montreal River and Maple Mountain
1904.....	206,875				
1905.....	2,451,356				
1906.....	5,401,766				
1907.....	10,023,311				
1908.....	19,424,251	500	13,124		
1909.....	25,658,683	26,185	194,955		18,002
1910.....	29,849,981	92,544	221,133	471,688	9,835
1911.....	29,989,893	114,789	933,912	468,687	510
1912.....	28,605,940	253,824	834,119	549,976	
1913.....	28,105,505	825,108	248,992	502,370	
1914.....	24,155,699	499,643	108,199	399,300	
1915.....	24,280,366	223,939		242,229	
1916.....	19,008,517	445,900	77,280	383,393	
1917.....	18,327,258		10,000	1,064,635	
1918.....	16,807,407	143,901	72,188	638,198	
1919.....	10,314,689	171,278	4,586	723,764	
1920.....	10,402,249		8,253	433,352	2,467*
1921.....	7,673,535	1,101	328,886	258,292	117
1922.....	9,239,147	1,028	1,284,307	170,651	15,994†
1923.....	7,259,558		2,955,646	160,761	1,581
1924.....	6,704,787		2,633,058	598,057	
1925.....	6,252,115		3,099,964	1,355,156	
1926.....	6,262,249		3,044,584	1,236,640	
1927.....	4,482,543		2,319,356	1,741,614	
1928.....	3,934,020		1,133,952	1,677,429	
Total.....	354,822,000	2,799,740	19,525,494	13,076,192	48,506

* Includes 885 oz. from Silver Islet, Lake Superior.

† Silver Islet, exclusively.

Table 118.—Percentage of Ontario's total Silver Production Credited to Each Producing Group, 1919-1928

Group	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928
	%	%	%	%	%	%	%	%	%	%
Cobalt district.....	48.7	58.6	51.8	74.4	60.8	51.2	(a) 60.1	31.5	22.0	26.0
Ontario smelters.....	36.4	33.7	41.1	19.3	30.5	39.4	26.7	(b) 56.2	(b) 70.1	(b) 61.7
Total production in Ontario....	85.1	92.3	92.9	93.7	91.3	90.6	86.8	87.7	92.1	87.7
Production in foreign smelters....	14.9	7.7	7.1	6.3	8.7	9.4	13.2	12.3	7.9	12.3
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Includes a small amount of silver from gold ores exported.

(b) Includes silver in gold bullion produced by gold mines, in nuggets sold for exhibition purposes and in products of the nickel refineries.

MANITOBA

Silver production in Manitoba during the year amounted to 1,763 ounces recovered from crude gold shipped to the Mint. Copper deposits were developed during the war, and from 1918 to 1920 shipments of copper ore containing silver were sent to Trail; in those three years, production from this source amounted to about 50,000 ounces. Owing to the drop in price of copper and to the high freight rates, practically no shipments of copper ores have been made in recent years. Recent developments in this province indicate that a resumption of production may be looked for at an early date. Copper-gold and copper-zinc properties are being opened up; the ore from these will likely yield some silver also.

Table 119.—Production of Silver in Manitoba, 1919-1928

Year	Fine ounces	Value \$
1919.....	20,700	23,069
1920.....	15,510	15,649
1921.....	33	20
1922.....	20	14
1923.....	5	3
1924.....	140	93
1925.....	477	329
1926.....	18	11
1927.....	12	7
1928.....	1,763	1,026

Table 120.—Production of Silver in British Columbia by Districts, 1927 and 1928

(From *Annual Report of the Minister of Mines for British Columbia.*)

District and division	1927		1928	
	Ounces	Value \$	Ounces	Value \$
Northwestern District (No. 1)—				
Atlin.....	5,307	2,992	133	78
Stikine.....				
Liard.....				
Nass River.....	298,152	168,068	273,068	158,860
Portland Canal.....	3,302,244	1,861,475	2,369,176	1,378,292
Skeena.....	12	7	1,166	678
Queen Charlotte.....				
Bella Coola.....				
Northeastern District (No. 2)—				
Cariboo.....	36	20		
Quesnel.....				
Omineca.....	173,072	97,561	343,653	199,924
Peace River.....				
Central District (No. 3)				
Nicola.....			1,595	928
Vernon.....	1,605	905		
Yale.....				
Ashcroft.....				
Kamloops.....	85,070	47,954	320	186
Lillooet.....	1,088	619	1,400	814
Clinton.....				
Southern District (No. 4)—				
Grand Forks.....	491	277	1,059	616
Greenwood.....	520,814	293,583	386,957	225,116
Osoyoos.....	111	62	3,148	1,831
Similkameen.....	137,971	77,774	150,757	87,705
Eastern District (No. 5)				
Fort Steele.....	5,123,925	2,888,357	5,595,565	3,255,276
Windermere.....	2,583	1,456	19,023	11,067
Golden.....	264	149		
Ainsworth.....	120,908	68,156	102,654	59,720
Slocan.....	402,065	226,644	1,117,993	650,404
Slocan City.....	31,334	17,663	13,906	8,090
Nelson.....	76,726	43,250	43,357	25,223
Arrow Lake.....				
Trail Creek.....	16,868	9,508	7,435	4,325
Revelstoke.....	2,025	1,142	1,808	1,052
Trout Lake.....	274	154	633	368
Lardeau.....	1,863	1,050	5	3
Western District (No. 6)—				
Nanaimo.....	6	3	128	74
Alberni.....				
Clayoquot.....				
Quatsino.....				
Victoria.....				
New Westminster.....				
Vancouver.....	165,361	93,214	192,228	111,831
Total.....	10,470,185	5,902,043	10,627,167	6,182,461

Table 121.—Imports into Canada and Exports of Silver, 1926-1928

	1926		1927		1928	
	Fine ounces	\$	Fine ounces	\$	Fine ounces	\$
IMPORTS—						
Silver in bars, blocks, ingo's, drops, sheets or plates unmanufactured.....		1,011,015		896,535		984,547
Silver manufactures of, n.o.p.....		371,565		344,021		350,567
Silver coin.....		55		410		
Total.....		1,382,635		1,240,966		1,335,114
EXPORTS—						
Silver contained in ore, concentrates, etc.....	5,890,280	3,546,952	5,445,117	2,894,386	6,815,691	3,824,385
Silver bullion.....	15,241,853	9,559,825	15,970,961	8,995,040	14,592,406	8,456,968
Silver coin.....						
Total.....	21,132,133	13,106,777	21,416,078	11,889,426	21,408,097	12,281,353

Table 122.—Monthly Average Prices of Silver, 1926-1928

From the *Engineering and Mining Journal*

Month	New York (Cents per fine ounce)			London (Pence per standard ounce)		
	1926	1927	1928	1926	1927	1928
January.....	67.765	55.795	57.135	31.322	25.863	26.313
February.....	66.773	57.898	57.016	30.797	26.854	26.205
March.....	65.880	55.306	57.245	30.299	25.655	26.329
April.....	64.409	56.399	57.395	29.682	26.136	26.409
May.....	65.075	56.280	60.298	30.125	26.072	27.654
June.....	65.481	56.769	60.019	30.248	26.203	27.459
July.....	64.793	56.560	59.215	29.861	25.983	27.262
August.....	62.380	54.718	58.880	28.773	25.224	27.095
September.....	60.580	55.445	57.536	27.904	25.565	26.440
October.....	54.505	56.035	58.087	25.291	25.776	26.727
November.....	54.141	57.474	57.953	25.192	26.526	26.704
December.....	53.466	57.957	57.335	24.733	26.701	26.362
Average.....	62.107	56.370	58.176	28.686	26.047	26.747

World Production.—In order of importance, the chief silver-producing countries of the world are: Mexico, United States, Canada and Peru. This places Canada third in the countries of the world and first in the British Empire.

The North American continent produced 186.6 million ounces in 1928 out of a total world's production of 258 million ounces. South America was credited with 29.8 million ounces, Europe, 11.6 million ounces, of which 6 millions were produced in Germany (including Silesia), and 2.7 million ounces, in Spain and Portugal. Oceania was credited with 10.5 million ounces, and the continent of Asia with 14.9 million ounces, whilst Africa, the greatest gold-producing continent of the world, produced only 1.2 million ounces of silver.

Table 123.—*World Production of Silver 1913 and 1924-1928

(Fine ounces)

(From Year Book of the American Bureau of Metal Statistics, 1922 and 1928)

	1913	1924	1925	1926	1927	1928
NORTH AMERICA—						
United States.....	66,801,500	64,221,655	61,377,977	60,918,000	59,412,000	56,149,000
Canada.....	31,524,708	19,736,323	20,228,988	22,371,924	22,736,698	21,922,795
Mexico.....	55,486,431	91,437,944	92,912,000	98,291,000	104,575,000	108,536,000
Total North America.....	153,812,639	175,395,922	174,518,965	181,580,924	186,723,698	186,607,795
Total—Central America and West Indies..	2,135,641	2,700,000	2,700,935	3,499,118	3,154,021	3,200,000
SOUTH AMERICA—						
Argentina.....	35,271	20,000	18,000	15,000	15,000	*15,000
Bolivia.....	3,932,594	4,857,608	5,174,000	5,834,003	5,402,840	5,573,000
Brazil.....	28,264	28,613	1,833	20,672	20,000	*20,000
Chile.....	Included with Bolivia	3,033,225	3,261,682	3,251,490	2,900,000	3,500,000
Colombia.....	587,683	2,900	2,900	125,953	131,417	*130,000
Ecuador.....	22,642	70,000	70,000	80,000	87,601	*85,000
Peru.....	9,617,094	18,717,087	20,746,909	22,523,036	18,295,408	20,541,000
Other countries.....	51,111	11,400	11,715	11,215	11,215	*11,000
Total South America.....	14,274,759	26,740,833	29,287,039	31,861,369	26,863,481	29,875,000
EUROPE—						
Austria-Hungary.....	2,104,107	28,678	23,920	14,050	9,677	*10,000
France.....	1,005,266	147,858	352,010	261,830	308,640	*300,000
Czecho Slovakia.....		732,538	707,300	765,491	750,000	*750,000
Great Britain.....	128,843	31,153	32,439	41,345	46,714	*45,000
Germany (including Silesia).....	6,182,445	4,787,521	5,291,890	5,629,140	6,040,700	6,000,000
Greece.....	803,750	160,750	254,274	254,300	241,125	*250,000
Italy.....	423,888	496,975	320,761	519,371	537,098	*550,000
Norway.....	300,602	424,380	504,755	308,640	321,821	*300,000
Rumania.....		72,209	76,581	93,685	140,688	*100,000
Russia.....		250,000	250,000	250,000	321,500	*350,000
Serbia.....	28,758					
Jugo-slavia.....		31,250	26,106	45,010	53,755	*55,000
Spain and Portugal.....	4,237,239	2,879,965	3,303,863	3,000,656	3,056,565	2,700,000
Sweden.....	33,339					
Total Europe.....	15,247,937	10,043,277	11,143,299	11,183,518	11,823,823	11,410,000
OCEANIA—						
New South Wales.....	14,504,889	9,256,671	9,220,160	9,709,741	9,696,500	
Queensland.....	604,979	276,651	385,489	252,540	84,118	
Victoria.....	16,195	4,216	2,082	2,373	1,471	
Tasmania.....	765,187	642,158	750,194	766,653	741,782	
Other states.....	190,680	90,163	82,684	63,766	54,568	
New Zealand.....	975,616	500,023	494,482	425,287	427,358	
Total Oceania.....	17,057,546	10,769,882	10,915,091	11,225,360	11,005,797	10,500,000
ASIA—						
India.....	125,209	5,309,203	4,854,923	5,124,982	6,024,806	7,425,000
China.....		110,000	110,000	135,000	100,000	*100,000
Chosen (Korea).....	15,048	54,662	70,299	51,927	52,000	*50,000
Dutch East Indies.....	465,980	2,083,256	2,385,016	2,363,829	2,285,801	*2,300,000
Japan.....	4,700,390	3,542,255	4,059,340	4,476,952	4,531,446	5,000,000
Turkey.....	1,509,133	219,906	219,900	225,050	225,050	*220,000
Other countries.....	51,763	11,008	13,162	14,314	25,159	*25,000
Total Asia.....	6,867,523	11,330,290	11,712,649	12,392,034	13,244,262	15,200,000
AFRICA—						
Algeria.....			96,450	169,141	118,087	*120,000
Belgian Congo.....	1,454				10,609	*10,000
Rhodesia.....	121,537	401,277	157,971	153,990	131,598	103,890
Transvaal, Cape Colony and Natal.....	952,928	1,396,943	1,161,470	981,333	1,011,736	1,031,376
Other countries.....		733	2,727	2,386	2,016	*2,000
Total Africa.....	1,075,919	1,798,953	1,418,618	1,306,850	1,274,046	1,267,266
Grand Total.....	210,471,964	233,779,157	241,697,187	253,049,173	254,093,588	257,980,061

(*) The basis of this table is the information published by the Director of the Mint. However, revisions and additions have been made so that the totals do not agree with the Mint figures. For 1928 the figures are based on actual reports or reliable estimates, except where the asterisk is used indicating that the figure is conjectural.

LEAD

CANADA

Canada's lead production includes (a) lead contained in ores exported less deductions for smelter losses valued at the average price in London for the year; (b) the lead contained in the base bullion made by the Consolidated Mining and Smelting Co., Ltd., valued at the average price in London for the year, and (c) the pig lead made by the Kingdon Mining, Smelting and Manufacturing Co. at Galletta, Ontario, at its *sales* value.

Production in 1928 included lead from the Sullivan mine in East Kootenay, B.C., and from many smaller mines in the Slocan District; from the Mayo district of the Yukon Territory; from the Galletta mine in Ontario as well as from some lead concentrates shipped from the Chelmsford District of Ontario; and from the Tetreault mine of Notre Dame des Anges, Portneuf county, Quebec.

Previous to 1904, lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces to a base bullion which was then exported for refining. A lead refinery employing the Betts electrolytic process has been in operation at Trail, B.C., since 1904 treating the product from lead blast furnaces.

Table 124.—Production of Lead in Canada, 1927 and 1928

Province	1927		1928	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	6,496,577	341,461	6,218,336	284,520
Ontario.....	7,990,709	528,729	6,814,757	402,289
British Columbia.....	292,770,544	15,388,020	317,722,146	14,537,377
Yukon.....	4,165,331	218,929	7,191,449	329,045
Total.....	311,423,161	16,477,139	337,946,68	15,553,231

Table 125.—Production* of Lead from Canadian Ores, 1887-1928

Year	Pounds	Value	Year	Pounds	Value
		\$			\$
1887.....	204,800	9,216	1907.....	47,738,703	2,542,086
1888.....	674,500	29,812	1908.....	43,195,733	1,814,221
1889.....	165,100	6,488	1909.....	45,857,424	1,692,139
1890.....	105,000	4,704	1910.....	32,987,508	1,216,249
1891.....	88,665	3,857	1911.....	23,784,969	827,717
1892.....	808,420	33,064	1912.....	35,763,476	1,597,554
1893.....	2,135,023	79,636	1913.....	37,662,703	1,754,705
1894.....	5,703,222	187,636	1914.....	36,337,765	1,627,568
1895.....	16,461,794	531,716	1915.....	46,316,450	2,593,721
1896.....	24,199,977	721,159	1916.....	41,497,615	3,532,692
1897.....	39,018,219	1,396,853	1917.....	32,576,281	3,628,020
1898.....	31,915,319	1,206,399	1918.....	51,398,002	4,754,315
1899.....	21,862,436	977,250	1919.....	43,827,699	3,053,037
1900.....	63,169,821	2,760,521	1920.....	35,953,717	3,214,262
1901.....	51,900,958	2,249,387	1921.....	66,679,592	3,828,742
1902.....	22,956,381	934,095	1922.....	93,307,171	5,817,702
1903.....	18,139,283	768,562	1923.....	111,234,466	7,985,522
1904.....	37,531,244	1,617,221	1924.....	175,485,499	14,221,345
1905.....	56,864,915	2,676,632	1925.....	253,590,578	23,127,460
1906.....	54,608,217	3,089,187	1926.....	283,801,265	19,240,661
			1927.....	311,423,161	16,477,139
			1928.....	337,946,688	15,553,231
			Total.....	2,636,879,759	159,383,483

*Previous to 1913 the figures reported show the metal content of the shipments and are somewhat in excess of the actual amount recovered. Since 1912 the data given represent the quantity of lead produced in Canada from domestic ores, together with the estimated lead recovery from lead ores and concentrates exported.

Table 126.—Production of Lead from Canadian Ores, by Provinces, 1887-1928

Year	Quebec		Ontario		British Columbia		Yukon	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
1887.....					204,800	9,216		
1888.....					674,500	29,813		
1889.....					165,100	6,488		
1890.....	105,000	4,704						
1891.....	88,665	3,857						
1892.....					808,420	33,064		
1893.....	3,931	146			2,131,092	79,490		
1894.....					5,703,222	187,636		
1895.....					16,461,794	531,716		
1896.....					24,199,977	721,159		
1897.....	177,084	6,340			38,841,135	1,390,513		
1898.....	221,760	8,382			31,693,559	1,198,017		
1899.....					21,862,436	977,250		
1900.....	11,200	490			63,158,621	2,760,031		
1901.....	318,052	13,784			51,582,906	2,235,603		
1902.....	420,000	17,090			22,536,381	917,005		
1903.....			50,000	2,119	18,089,283	766,443		
1904.....			885,000	38,135	36,646,244	1,579,086		
1905.....			284,212	13,378	56,580,703	2,663,254		
1906.....			2,200,000	124,454	52,408,217	2,964,733		
1907.....					47,738,703	2,542,086		
1908.....					43,195,733	1,814,221		
1909.....					45,857,424	1,692,139		
1910.....					32,987,508	1,216,249		
1911.....					23,784,969	827,717		
1912.....					35,763,476	1,597,554		
1913.....			33,000	1,537	37,626,899	1,753,037	2,904	131
1914.....					36,289,845	1,625,422	47,920	2,146
1915.....	40,401	2,262	88,985	4,983	46,377,064	2,541,116	810,000	45,360
1916.....	698,760	59,485	685,932	58,393	39,157,701	3,333,496	955,222	81,318
1917.....	1,378,001	153,468	1,586,711	176,712	29,483,725	3,283,602	127,844	14,238
1918.....	2,110,059	195,180	1,684,366	155,804	47,594,328	4,402,475	9,249	856
1919.....	2,280,000	158,825	1,487,586	103,625	40,060,113	2,790,587		
1920.....	905,472	80,949	2,255,520	201,643	32,792,725	2,931,670		
1921.....	595,881	34,215	3,312,493	190,203	60,298,603	3,462,346	2,472,615	141,978
1922.....			2,890,397	180,216	87,093,266	5,430,265	3,323,508	207,221
1923.....	520,041	37,334	4,401,494	315,983	99,541,818	7,146,817	6,771,113	486,098
1924.....	1,058,983	85,820	5,055,368	409,687	188,467,628	13,652,617	903,520	73,221
1925.....	2,051,100	187,060	7,209,534	657,510	242,454,502	22,111,850	1,875,442	171,040
1926.....	3,729,636	251,788	7,398,795	580,730	266,812,461	18,012,509	5,860,373	395,634
1927.....	6,496,577	341,461	7,990,709	528,729	292,770,544	15,388,020	4,165,331	218,929
1928.....	6,218,336	284,520	6,814,757	402,289	317,722,146	14,537,377	7,191,449	329,045
Total.....	29,428,939	1,927,160	56,314,859	4,146,130	2,516,619,571	351,142,979	34,516,390	2,167,215

Table 127.—Refined Lead Produced in Canada,* 1904-1928

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1904.....	7,519,440	1913.....	37,923,043	1922.....	81,412,716
1905.....	15,804,509	1914.....	36,443,706	1923.....	101,096,312
1906.....	20,471,314	1915.....	43,518,618	1924.....	130,471,208
1907.....	26,607,461	1916.....	33,087,474	1925.....	213,217,605
1908.....	36,549,274	1917.....	32,115,114	1926.....	257,273,585
1909.....	41,883,614	1918.....	31,571,112	1927.....	295,766,327
1910.....	32,987,508	1919.....	34,330,920	1928.....	301,067,819
1911.....	23,525,050	1920.....	28,720,030	Total.....	1,960,206,742
1912.....	35,893,190	1921.....	60,949,793		

* Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galletta, Ont.

QUEBEC

During 1922 there was no production of lead from Quebec mines but in the next year shipping was resumed and through a system of selective flotation worked out by the Mines Branch, Ottawa, good lead and zinc concentrates were made and production increased year by year. Considerable interest has been displayed in the Gaspé peninsula as a possible producer of lead and zinc ore. The Federal Zinc and Lead Company have done a considerable amount of development work in this district. Other companies interested in Gaspé are the Pioneer Mining Corporation, Limited; the Huronian Belt Limited; the British Metals; and Messrs. Lyall and Beidelman. Lead has also been found associated with zinc in the copper-gold ores of the Rouyn district of western Quebec.

ONTARIO

Many years ago, two lead mines were operated in Frontenac county but it was not until 1913 that any statistical records were kept. During that year the Kingdon mine, Carleton county, on which some work was done as far back as 1884 and 1885, was re-opened and some 33,000 pounds of lead were recovered. The vein has been followed to a depth of over 1,100 feet and in the underground workings for a horizontal distance of over 2,500 feet. At the lower levels zinc also occurs. A zinc concentrate is made and stored until a sufficient supply in on hand to make an export shipment.

Small quantities of lead are recovered from the silver-lead-bismuth bullion exported by the smelter operating on ores of the Cobalt district.

BRITISH COLUMBIA

British Columbia is by far the largest lead-producing province in the Dominion and in the Sullivan mine has the largest lead and zinc mine in the world. There are other silver-lead-zinc mines as well which are situated in the Fort Steel and Slocan-Ainsworth districts, and numerous other fields supply ore. Many properties in the southern section of the province ship to the smelter at Trail while the newer properties in the northern part of the province ship to foreign smelters.

YUKON

The principal producer in the Yukon is the Treadwell Yukon Co., Ltd. which company operates a mill and buys ore from small operators in the district. Some small operators ship high-grade ore directly to smelters in the United States.

Table 128.—Imports into Canada and Exports of Lead, 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	\$	Pounds	\$	Pounds	\$
IMPORTS—						
Old and scrap, pig and block.....	766,939	67,671	405,127	33,165	531,404	31,141
Bars and sheets.....	116,846	11,887	112,039	8,900	161,970	10,742
Litharge.....	2,229,600	223,839	3,015,000	245,630	3,977,300	279,136
Acetate and nitrate of lead.....	140,046	13,492	337,044	28,218	261,768	21,382
Other manufactures.....	-	263,398	-	344,053	-	342,349
Pipe lead.....	116,344	11,011	109,293	8,456	184,754	13,648
Shots and bullets.....	12,316	1,543	14,129	1,514	11,158	1,408
Tea lead.....	83,531	10,362	59,803	5,936	34,659	3,022
Lead pigments—						
Dry white lead.....	60,606	5,539	338,399	24,879	289,001	21,761
White lead, ground in oil.....	73,468	7,539	360,301	28,252	492,497	39,211
Dry red lead and orange mineral....	1,158,873	112,915	1,844,288	125,358	1,469,943	100,733
Total.....	-	729,196	-	854,367	-	864,533
EXPORTS—						
Lead in ore.....	13,644,900	796,412	13,032,600	844,637	14,962,900	893,709
Pig lead.....	202,510,300	12,983,907	239,409,100	11,981,388	255,421,700	10,172,075
Total.....	216,155,200	13,780,319	252,441,700	12,826,025	270,384,600	11,065,784

Table 129.—Monthly Average Prices of Pig Lead, Montreal,* New York and London,† 1926-1928

Month	Montreal (Value in cents per pound)			New York (Value in cents per pound)			London‡ (Value in pounds sterling per long ton)		
	1926	1927	1928	1926	1927	1928	1926	1927	1925
January.....	9-07	7-52	6-40	9-255	7-577	6-500	34-778	27-485	21-773
February.....	8-02	7-48	6-11	9-154	7-420	6-329	33-903	27-344	20-283
March.....	8-54	7-62	5-96	8-386	7-577	6-000	31-625	27-845	19-938
April.....	7-79	7-22	5-90	7-971	7-126	6-100	28-775	26-546	20-306
May.....	7-53	6-82	5-84	7-751	6-616	6-123	28-253	25-054	20-483
June.....	7-81	6-65	5-91	8-033	6-414	6-300	29-986	24-438	20-985
July.....	8-07	6-45	5-83	8-499	6-344	6-220	31-716	23-491	20-602
August.....	8-30	6-40	5-98	8-908	6-681	6-248	32-756	23-119	21-634
September.....	8-23	6-07	6-11	8-786	6-297	6-450	32-085	21-446	22-050
October.....	8-00	5-87	6-14	8-402	6-250	6-500	30-821	20-479	22-082
November.....	7-82	6-06	6-21	8-005	6-259	6-389	29-270	20-889	21-239
December.....	7-77	6-43	6-27	7-855	6-504	6-495	28-932	22-163	21-342
Average.....	8-15	6-73	6-06	8-417	6-755	6-305	31-075	24-192	21-060

*Producers' prices for car load quantities ex-cars Montreal, as furnished by the Consolidated Mining and Smelting Company.

†From the *Engineering and Mining Journal*.

‡Computed at par (\$4-8666), the London price of lead in 1926 was 6-751 cents per pound; in 1927—5-256 cents per pound; and in 1928—4-575 cents per pound.

Table 130.—World Production of Lead, 1913 and 1924-1928

(From the *Year Book of the American Bureau of Metal Statistics* 1922 and 1928).
(Short tons)

Country	1913	1924	1925	1926	1927	1928
United States.....	435,665	590,000	662,500	696,000	673,000	649,800
Canada.....	18,822	86,583	120,994	141,386	155,845	170,324
Mexico.....	68,324	177,697	205,159	220,879	274,025	280,675
Total North America.....	522,811	854,280	994,653	1,058,265	1,102,870	1,080,799
Argentina.....		*5,000	8,488	9,370	8,598	9,139
Peru (b).....		(e)	(c)	(c)	3,601	16,208
Other South America (b).....	2,729	7,900	4,700	10,100	2,500	1,000
Total South America.....	2,729	12,900	13,188	19,470	14,699	26,347
Austria-Hungary (a).....	26,558	5,494	5,961	7,141	8,913	8,967
Belgium.....	59,056	64,286	72,278	68,080	72,906	71,414
Czechoslovakia.....		2,496	2,426	2,537	2,677	2,879
France.....	31,756	20,811	22,641	21,495	27,528	26,255
Germany (excluding Upper Silesia).....	(e) 207,176	55,335	77,712	84,436	92,593	95,900
Great Britain.....	20,304	5,938	5,303	4,777	6,759	6,173
Upper Silesia.....		22,130	30,146	30,648	31,839	39,953
Greece.....	20,177	5,628	5,914	5,822	5,291	7,937
Italy.....	23,885	24,318	26,979	26,003	26,206	23,435
Jugoslavia.....		12,662	12,070	10,812	11,764	11,314
Poland (excluding Upper Silesia).....	2,976					
Russia.....	1,678	709	1,067	1,479	2,039	3,307
Spain.....	219,110	147,708	152,338	162,470	153,278	135,652
Sweden.....	1,361	740	901	621	457	
Total Europe.....	614,037	368,255	415,736	426,121	442,250	432,186
Turkey.....	15,318	5,626	5,276	6,629	8,655	7,674
India (Burma).....	6,535	57,969	52,945	60,849	73,883	87,790
Japan.....	4,162	3,242	3,678	3,978	3,741	4,409
Total Asia.....	26,015	66,837	61,899	71,456	86,279	99,873
Australia.....	126,207	140,645	165,634	170,412	184,710	182,808
Rhodesia.....		7,003	3,674	4,292	6,561	5,230
Tunis.....		17,345	15,070	20,262	20,571	19,407
Total Africa.....		24,348	18,744	24,554	27,132	24,637
Grand Totals.....	1,291,799	1,467,265	1,669,854	1,770,278	1,857,940	1,846,650

(a) After 1918, figures are for Austria alone.

(b) Does not include lead produced from South American ore exported to European countries, principally Belgium and Germany.

(c) Included in "Other South America".

(d) The statistics of lead production in Polish Silesia have been changed so that they are now given in terms of base bullion, which conforms to the practice in respect of most of the other countries. This change has been made retrospectively beginning 1922.

(e) Include production for Upper Silesia in 1913.

(f) Dominion Bureau of Statistics reports the Canadian production of lead as follows: 1913, 18,831 tons; 1924, 87,743 tons; 1925, 126,795 tons; 1926, 141,900 tons; 1927, 155,712 tons; 1928, 168,973 tons.

ZINC

Refined zinc is produced at Trail, B.C., from the silver-lead-zinc ores of the West Kootenay district and from the Sullivan mine at Kimberley, B.C. Zinc concentrates are exported to Belgium, and France from the Tetreault silver-lead-zinc property in Quebec. The Treadwell Yukon Mining Co., Ltd. made two small test shipments of zinc concentrates from its property in the Sudbury district, near Chelmsford, Ontario.

Figures for the Canadian total production of zinc are made up by adding the production of refined zinc at Trail to the amount of zinc estimated as recoverable from ores exported; the value of production is calculated at the monthly average price for zinc on the London market for the year, exchange conversion being made at par. Previous to 1926, the average price on the St. Louis market was used, but as the bulk of Canada's zinc output is exported and sold on the basis of London quotations, it was thought that a more accurate aggregate value would be obtained by using prices quoted in London, and in 1926 this change in practice was made. It may be noted that the present procedure is in conformity with the practice of the British Columbia Department of Mines.

Table 131.—Production of Zinc in Canada, 1927 and 1928

Province	1927		1928	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	17,189,046	1,064,690	21,057,760	1,156,745
Ontario.....			58,724	3,226
British Columbia.....	148,306,479	9,186,103	163,530,890	8,983,079
Total.....	165,495,525	10,250,793	184,647,374	10,143,050

Table 132.—Production of Zinc from Canadian Ores, 1898-1928

Year	Quantity	Value	Year	Quantity	Value
		\$			\$
(From 1898 to 1904, quantities show pounds of zinc contained in ores or concentrates shipped from the mines)			1914.....	10,893	262,563
1898 (a).....	788,000	36,011	1915.....	14,895	554,938
1899.....	814,000	46,805			
1900.....	212,800	9,342	(From 1916 to date, quantities show pounds of zinc recovered by Canadian smelters, and estimated recoveries by foreign smelters)		
1901.....			1916.....	23,364,760	2,991,623
1902.....	142,200	6,882	1917.....	29,668,764	2,640,817
1903.....	900,000	48,600	1918.....	35,083,175	2,862,436
1904.....	477,568	24,350	1919.....	32,194,707	2,362,448
(From 1905 to 1915 quantities show tons of ore or concentrates shipped from the mines)			1920.....	39,863,912	3,057,961
1905.....	9,413	139,200	1921.....	53,089,356	2,471,310
1906.....	1,154	23,800	1922.....	56,290,000	3,217,536
1907.....	1,573	49,100	1923.....	60,416,240	3,991,701
1908.....	452	3,215	1924.....	98,909,077	6,274,791
1909 (b).....	18,371	242,699	1925.....	109,268,511	8,328,446
1910.....	5,063	120,003	1926.....	149,938,105	11,110,413
1911.....	2,590	101,072	1927.....	165,195,525	10,250,793
1912.....	6,415	211,774	1928.....	184,647,374	10,143,050
1913.....	7,889	186,827	Total.....		71,770,506

(a) No Mines Branch records of production prior to 1898.

(b) Includes 7,424 tons shipped late in 1908.

Table 133.—Production of Zinc from Canadian Ores, by Provinces, 1898-1928

Year	Quebec		Ontario		Alberta		British Columbia	
	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$
From 1898 to 1904, quantities show pounds of zinc contained in ores or concentrates shipped from the mines)								
1898 (a).....	788,000	36,011						
1899.....			814,000	46,805				
1900.....	22,400	983	190,400	8,359				
1901.....								
1902.....			142,200	6,882				
1903.....			900,000	48,600				
1904.....			477,568	24,350				
(From 1905 to 1915 quantities show tons of ore or concentrates shipped from the mines)								
1905.....							9,413	139,200
1906.....			500	6,700			654	17,106
1907.....			217	3,000			1,356	46,100
1908.....			452	3,215				
1909.....			895	8,950			(b) 17,476	233,749
1910.....			576	5,700			4,487	114,243
1911.....							2,590	101,072
1912.....			10	375			6,405	211,399
1913.....	335	6,700					7,554	180,127
1914.....	969	10,017					9,924	252,546
1915.....	300	16,500					14,595	538,438
(From 1916 to date, quantities show pounds of zinc recovered by Canadian smelters and estimated recoveries by foreign Smelters.)								
1916.....	1,663,200	212,956					21,701,560	2,778,667
1917.....	1,786,740	159,038			20,583	1,832	27,861,441	2,479,947
1918.....	2,802,928	228,691					32,280,247	2,633,745
1919.....	1,752,000	128,562	147,692	10,838			30,295,015	2,223,048
1920.....	1,120,200	85,931	13,950	1,070			38,729,762	2,970,960
1921.....							53,089,356	2,471,310
1922.....							56,290,000	3,217,536
1923.....	366,240	24,197					60,050,000	3,967,504
1924.....	2,909,008	184,547					96,000,089	6,090,244
1925.....	9,936,000	757,322	179,545	13,685			99,152,966	7,557,439
1926.....	12,904,176	956,199					137,033,929	10,154,214
1927.....	17,189,046	1,064,690					148,306,479	9,186,103
1928.....	21,057,760	1,156,745	58,724	3,226			163,530,890	8,983,079
Total.....		5,629,089		191,815		1,832		66,547,770

(a) No *Mines Branch* records of production prior to 1898.

(b) Includes 7,424 tons shipped late in 1908.

Table 134.—Production of Refined Zinc at Trail, B.C., 1916-1928

Year	Short tons	Year	Short tons
1916.....	2,974	1922.....	28,145
1917.....	9,985	1923.....	30,025
1918.....	12,574	1924.....	27,444
1919.....	12,326	1925.....	38,462
1920.....	18,517		
		1926.....	61,727
1921.....	26,494	1927.....	73,208
		1928.....	81,765

Table 135.—Imports into Canada and Exports of Zinc and Brass, 1926-1928

	1926		1927		1928	
	Pounds	Value	Pounds	Value	Pounds	Value
IMPORTS		\$		\$		\$
Zinc and Zinc Products—						
Zinc, in blocks, pigs and sheets.....	5,797,282	582,784	5,911,727	512,389	9,299,015	687,293
Zinc, as spelter.....	1,122,640	86,779	1,355,816	89,233	1,845,258	107,920
Zinc white (80% Zn.).....	13,278,306	943,724	16,665,713	1,113,573	18,128,357	1,166,491
Zinc dust.....	435,440	46,800	339,055	34,110	458,923	44,906
Zinc, sulphate and chloride of (44% Zn.)	1,650,725	73,604	2,032,015	86,149	2,530,141	98,501
Zinc, manufactures of.....		156,637		277,236		169,071
Total.....		1,890,328		2,112,690		2,274,182
Brass and Brass Products—						
Brass, in blocks, pigs and ingots (30% Zn.)	432,300	51,971	819,500	99,956	1,175,200	153,488
Brass, old and scrap (30% Zn.).....	2,669,500	265,637	2,908,500	270,627	3,395,700	356,000
Brass, tubing (30% Zn.).....	2,726,066	672,435	2,765,078	627,124	3,322,210	748,869
Brass, plain wire (30% Zn.).....	487,881	126,360	453,239	113,668	393,204	98,658
Brass, bars and rods.....	1,077,300	190,436	652,300	114,270	780,200	143,934
Brass, strips, sheets or plates.....	1,424,700	264,193	784,700	158,742	1,409,500	262,767
Brass, wire cloth, n.o.p.....		102,112		48,030		53,463
Brass, cup for manufacture of shells.....		115,141		96,773		157,274
Brass, caps for electric batteries.....		17,094		16,373		11,710
Brass, hand-pumps.....		20,567		25,479		28,511
Brass, nails, tacks, etc.....		1,777		3,057		5,214
Brass and copper rivets, burrs and washers.....		49,006		85,576		87,659
Brass valves.....		254,853		307,753		401,824
Brass, other manufactures, n.o.p.....		2,656,189		3,089,060		3,660,436
Carburettors of brass.....		146,248		39,444		35,015
Tubing, brass or copper, not more than 3/4-inch in diameter, in lengths not less than 6 feet, coated with metal, and not polished, bent or otherwise manufactured.....	883	205	5,335	1,173	2,043	383
Total.....		4,934,224		5,097,105		6,205,205
EXPORTS						
Zinc—In Ore.....						
Ore.....	83,834,000	1,393,165	50,454,000	862,498	22,510,000	1,438,619
Spelter.....	96,008,100	7,107,876	112,420,400	6,826,808	127,188,500	6,602,867
Scrap, dross and ashes.....	3,187,300	114,015	5,877,100	178,562	6,944,000	203,884
Total.....		8,615,056		7,867,868		8,245,370
Brass—						
Old and scrap.....	6,071,400	536,889	7,296,400	584,725	11,548,200	984,071
Rods, sheets and tubing.....	59,900	13,089	47,300	10,054	49,600	9,385
Valves.....		161,899		248,385		261,419
Mfrs. of brass, n.o.p.....		141,878		505,848		594,159
Total.....		853,755		1,349,012		1,849,634

Table 136.—Monthly Average Prices of Zinc at Montreal, St. Louis and London, 1926-1928

Month	Montreal ¹ (In cents per pound)			St. Louis ² (In cents per pound)			London ² (In pounds Sterling per long ton)		
	1926	1927	1928	1926	1927	1928	1926	1927	1928
January.....	9.80	8.18	7.10	8.304	6.661	5.643	38.059	30.979	26.125
February.....	9.31	8.17	7.00	7.759	6.673	5.551	36.053	29.931	25.518
March.....	8.82	8.16	7.08	7.332	6.692	5.624	34.090	30.649	25.082
April.....	8.49	7.80	7.21	7.001	6.338	5.759	32.503	29.579	25.493
May.....	8.31	7.53	7.39	6.821	6.075	6.026	32.038	29.034	26.102
June.....	8.58	7.68	7.35	7.112	6.213	6.158	33.244	28.598	25.664
July.....	8.87	7.66	7.23	7.411	6.229	6.201	34.045	28.280	24.946
August.....	8.85	7.80	7.15	7.376	6.342	6.249	34.173	28.210	24.540
September.....	8.89	7.67	6.97	7.413	6.212	6.250	34.389	27.347	24.497
October.....	8.76	7.46	6.91	7.296	5.996	6.250	34.256	26.899	24.030
November.....	8.70	7.20	6.99	7.199	5.745	6.263	33.491	26.281	24.801
December.....	8.51	7.18	7.30	7.018	5.722	6.349	32.915	26.363	26.609
Average.....	8.83	7.71	7.14	7.337	6.242	6.027	34.105	28.513	25.284

¹Supplied by Consolidated Mining and Smelting Co., Montreal, P.Q.²From the *Engineering and Mining Journal*.

Converted at par, the average London quotations in cents per pound were: in 1926=7.410 cents; in 1927=6.194 cents, and in 1928 were 5.493 cents.

Table 137.—World Production of Zinc, (a) 1913 and 1924-1928

(From the *Year Book of the American Bureau of Metal Statistics*)

(Short tons)

Country	1913	1924	1925	1926	1927	1928
United States.....	352,952	535,846	590,928	638,533	613,548	619,595
Mexico.....			1,406	6,550	7,089	12,368
Canada.....		27,443	38,481	61,727	73,528	81,765
Belgium.....	225,050	178,242	188,339	208,078	219,457	230,689
Czechoslovakia.....		7,603	3,307	3,074	5,421	9,103
France.....	74,815	63,614	74,693	80,969	92,161	106,783
Germany.....	(c) 307,238	45,745	64,620	75,361	92,706	108,136
Great Britain.....	73,000	43,098	42,726	20,148	46,893	62,043
Italy.....		6,569	7,141	8,417	8,121	11,821
Jugoslavia.....		2,343	2,460	2,619	3,511	4,762
Netherlands.....	26,804	20,051	23,277	27,333	28,955	29,635
Norway.....	10,234	5,538	7,503	5,907	6,049	6,063
Poland (b).....	8,398	102,614	126,098	136,393	165,755	178,524
Russia.....		661	1,653	2,059	2,568	4,740
Spain.....	3,650	14,084	16,069	17,707	18,346	14,831
Sweden.....	2,204	3,881	5,233	5,291	5,160	5,529
Australia.....	4,614	52,205	51,280	52,942	54,438	55,010
Japan.....	992	15,508	18,684	18,708	18,739	20,944
French Indo-China.....		143	1,276	1,396	1,261	3,307
Rhodesia.....						10,730
Totals.....		1,125,188	1,265,714	1,373,212	1,463,736	1,576,578

(a) Slab zinc produced in the several countries, unallocated according to the origin of the ore.

(b) Under the head of Poland has been included the production of Upper Silesia and Galicia, when those provinces belonged to Germany and Austria, respectively.

(c) Includes Upper Silesia in 1913.

CHAPTER FIVE

THE NICKEL-COPPER INDUSTRY IN CANADA

Including Commodity Statistics Tables on NICKEL, COPPER, and METALS of the PLATINUM GROUP

1. General Review.
2. Commodity statistics including tables showing production, by provinces, imports, exports, prices and world output of nickel, copper and metals of the platinum group.

1. General Review

(a) *Definition of the Industry.*—The nickel-copper industry in Canada includes the mining, smelting, and to a certain extent, the refining of the nickel-copper ores of the Sudbury district in the province of Ontario. Smelting operations are carried on in close proximity to the mines, and refining is done at Port Colborne in Ontario by one of the companies, while the other exports matte for treatment in its refinery at Clydach, Wales.

As thus defined, the industry takes in the Canadian sources of nickel, metals of the platinum group, and one of the principal sources of copper.

Another industry, the copper-gold-silver mining group also produces a large part of the Dominion output of copper, but as the ores of this group, in the aggregate, usually carry about one-tenth of the gold produced each year from Canadian mines, the activities of the copper-gold mines are reviewed in the chapter on the gold mining industry. Production and trade statistics on nickel, copper and the metals of the platinum group are given in this chapter.

(b) *Historical.*—Construction of railways in Canada has lead in several instances to the discovery of valuable mineral deposits as for example, the finding of the nickel-copper ore bodies in the Sudbury area when the Canadian Pacific Railway was being built in 1883. The first of these was worked in 1886 primarily for copper, the presence of nickel not being detected until 1887. About this time the use of nickel in the manufacture of nickel steel was introduced and the resulting demand for nickel made possible the successful development of the great industry that has now become firmly established. Nickel steel was made in large quantities for armament purposes, and nickel production reached its peak during the great war. After hostilities ceased, the demand for nickel was considerably reduced and the nickel industry was depressed. Since that time, by intensive research, new uses have been found for this metal and production in 1928 far exceeded any previous output.

(c) *Importance of Nickel, Copper and Platinum Group Metals.*—About 90 per cent of the world's supply of nickel is derived from Canadian ores, the remainder being obtained in New Caledonia and Norway. A small amount of nickel is found in the silver-cobalt ores of the Cobalt district, but most of the tonnage is produced from the ores of the Sudbury area.

Copper produced from the nickel-copper ores in Ontario constitutes about 35 per cent of the total copper obtained from all Canadian ores. British Columbia, mining and smelting copper ores and copper-gold ores, produces more than 60 per cent of Canada's copper output. Quebec supplies the remainder.

As a world producer of copper, Canada ranks fourth, contributing about 4 per cent of the world's output annually. The amount of refined copper produced in Canada is relatively small as, usually, it has been found more profitable not to refine in Canada but to ship blister copper or copper in matte or in concentrates, to smelters in other countries where the demand for refined

copper is greater than in Canada. Improvement in Canadian demand for the refined metal may be expected as a phase of the industrial expansion now being observed, and the output of refined copper from Canadian plants, ought to increase proportionately, unless other untoward features of the market arise to check this progress.

Some gold and silver as well as metals of the platinum group, including, besides platinum, the related metals, palladium, rhodium, osmium and iridium, are present in varying amounts in the different ores of the Sudbury district. Some of these ores are richer than others in precious metals, and the recovery of platinum group metals, therefore, has been a feature of the work done by one of the great nickel companies, while the other company has found it profitable to enter this field only comparatively recently when the improved grade of ore being mined was found sufficiently rich to make the additional work worth while.

At the present time, Canada produces about 6 per cent of the world's supply of platinum, but recovery of much of this metal is carried out in refineries operating outside the confines of the Dominion.

Interest in the development work carried on by the two large companies operating nickel-copper properties in the Sudbury area increased during 1927. The International Nickel Company of Canada, Limited, continued to operate the Creighton mine and the smelter at Coppercliff and to produce refined and electrolytic nickel, nickel oxides and salts, and blister or converter copper in the refinery at Port Colborne, Ontario. Development of the Froid mine added greatly to the company's reserves. The Mond Nickel Company Limited, operating the Garson, Froid Extension, Worthington and Levack mines and the smelter at Coniston, Ontario, worked steadily throughout the year producing matte for shipment to the company's refinery at Clydach, Wales, and utilized the bessemer gases for the manufacture of high-grade sulphuric acid for which a splendid market has been established. Low production costs enable the company to make very favourable contracts with large users of acid. The collapse of the Worthington mine late in the year put an end to operations on this property. Fortunately, due to the care exercised by the operating staff at the mine, no lives were lost when the mine caved in. The loss of the Worthington mine which has been worked for about 20 years, while serious, was not so important as it would have been before the Froid ore body was proven. Work on this mine is being carried forward rapidly.

(d) *Mining*.—The ore in the Sudbury district averages from 2 to 4 per cent of nickel and from 1 to 3 per cent of copper, and is a mixture of the sulphides of copper, nickel and iron in the form of pyrrhotite and chalcopyrite associated with norite, a basic intrusive rock. Open-pit methods of mining were first used, but later, underground workings were adopted. Shafts are sunk and haulage ways are driven into a solid foot wall, the ore being intersected at intervals by cross cuts. The ore is usually hoisted to rock houses where it is crushed and hand-sorted; the high-grade material is suitable for direct smelting. Ore from the Froid mine cannot be hand-sorted satisfactorily because the precious metals are finely disseminated through the vein-bearing rock, so that crushing and concentration of the product from the mine are necessary before smelting can be undertaken with satisfactory results.

(e) *Smelting and Refining*.—Practice in the preparation of the ore for smelting varies. The International Nickel Company heap-roasts the coarse ore before smelting, and the Mond Nickel Company roasts only the fines and flue dust on Dwight-Lloyd sintering machines. Both companies smelt in water-jacketed furnaces, producing a slag which is sent to the dump, and a matte which contains 15 to 25 per cent of copper-nickel in addition to sulphur. This low-grade matte is transferred to a basic converter where practically all of the iron and part of the sulphur are eliminated. The product of these converters, bessemer matte, contains about 80 per cent copper-nickel; 19.5 per cent sulphur; 0.5 per cent iron; this product is shipped to the refineries for further treatment.

The International Nickel Company ships some matte to the Port Colborne refinery, where the products are converter copper, containing some gold and silver; electrolytic nickel; refined nickel and nickel oxide; and residues containing palladium and platinum. This company exports

the remainder of the matte produced at the smelter to Huntingdon, West Virginia, U.S.A., for manufacture into monel metal, an alloy of copper and nickel in which the constituents are present in about the same proportions in which they occur in the ore and are not separated during refining process.

The Mond Nickel Company ships the smelter matte to the company's refinery at Clydach, Wales, for reduction. The refinery produces nickel metal of very high purity that finds many uses in the metallurgical field, and copper sulphate, mostly for use as an insecticide. Much of the nickel from the Mond plant near Clydach, Wales, is shipped to plants in other countries, notably the United States, for use in the manufacture of nickel alloys.

A considerable market has been built up for these alloys because of their resistance to corrosion. Chemical works, creameries, and other plants of a similar nature, are gradually increasing their uses for nickel and its alloys.

Table 138.—Capital Employed in the Nickel-Copper Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings, plant, machinery and tools—		
Mines.....	38,893,815	45,106,028
Smelters and refinery.....	17,954,652	20,199,878
Cost of materials and supplies on hand.....	6,789,455	5,075,811
Cash, trading and operating accounts and bills receivable.....	5,798,782	6,225,842
Total.....	69,436,704	76,635,559

Table 139.—Output from Nickel-Copper Mines and Smelters in Canada, 1927 and 1928

		1927	1928
Ore mined.....	tons	1,305,917	1,457,910
Ore shipped.....	tons	1,305,917	1,457,910
Content of ores, etc., shipped:—			
Copper.....	lb.	55,128,978	67,485,937
Nickel.....	lb.	87,147,139	100,420,842
Ores and concentrates treated at smelters.....	tons	1,350,214	1,476,704
Matte produced.....	tons	81,848	91,313
Content of matte:—			
Copper.....	lb.	51,937,215	59,408,538
Nickel.....	lb.	79,246,144	86,788,830
Matte shipped to Canadian refineries.....	tons	39,942	68,463
Matte exported to Foreign smelters.....	tons	33,541	39,310

Table 140.—Proportion of Nickel and Copper in Sudbury Matte, 1912-1928

Year	Percentage		
	Nickel	Copper	Total
1912.....	53.5	26.3	79.8
1913.....	52.7	27.4	80.1
1914.....	49.0	31.1	80.1
1915.....	50.3	29.0	79.3
1916.....	51.6	28.0	79.6
1917.....	50.6	26.9	77.5
1918.....	52.6	26.0	78.6
1919.....	51.6	28.3	79.9
1920.....	52.7	27.6	80.3
1921.....	49.4	32.4	81.8
1922.....	50.1	31.3	81.4
1923.....	53.4	27.2	80.6
1924.....	52.6	27.9	80.5
1925.....	52.1	27.9	80.0
1926.....	49.6	30.6	80.2
1927.....	48.4	31.7	80.1
1928.....	47.6	32.6	80.2

Table 141.—Employees, Salaries and Wages, in the Nickel-Copper Industry in Canada, 1927 and 1928.

	1927				1928			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees—								
Mine and mill.....	27		27	85,048	43	1	44	142,249
Smelters and refinery.....	132	14	146	459,119	128	15	143	464,560
Total	159	14	173	544,167	171	16	187	606,809
Wage-earners—								
Mines and mill.....	1,590		1,590	2,401,265	1,919		1,919	2,994,589
Smelters and refinery.....	1,756	1	1,757	2,518,181	2,006	1	2,007	3,062,121
Total	3,346	1	3,347	4,919,446	3,925	1	3,926	6,056,710
Grand total	3,505	15	3,520	5,463,613	4,096	17	4,113	6,663,519

Table 142.—Employees by Months in the Nickel-Copper Industry in Canada, 1927 and 1928

Month	Mine		Mill	Smelters	Refinery	Total
	Surface	Under-ground				
1927						
January.....	296	1,007	110	1,377	500	3,290
February.....	301	1,049	146	1,378	556	3,430
March.....	309	1,164	179	1,261	533	3,446
April.....	332	1,138	177	1,210	536	3,393
May.....	307	1,172	175	1,184	427	3,265
June.....	337	1,144	158	1,191	522	3,352
July.....	335	1,134	150	1,188	517	3,324
August.....	323	1,133	179	1,241	507	3,383
September.....	314	1,148	172	1,272	509	3,415
October.....	368	1,093	118	1,242	501	3,322
November.....	351	1,091	118	1,232	505	3,297
December.....	330	1,104	125	1,232	459	3,250
1928						
January.....	368	1,079	119	1,188	505	3,259
February.....	366	1,089	119	1,160	609	3,343
March.....	351	1,108	116	1,154	624	3,353
April.....	360	1,137	115	1,134	655	3,401
May.....	371	1,173	116	1,166	715	3,541
June.....	392	1,215	114	1,221	770	3,712
July.....	416	1,291	108	1,239	788	3,842
August.....	450	1,378	117	1,232	924	4,101
September.....	520	1,494	115	1,237	930	4,296
October.....	533	1,575	120	1,250	985	4,463
November.....	514	1,653	115	1,247	1,018	4,547
December.....	494	1,641	128	1,295	1,043	4,601

NICKEL

Production figures include nickel in matte and speiss exported from the Canadian smelters valued at 18 cents per pound; refined and electrolytic nickel produced in Canada, valued at the average price received for sales of nickel metal from the refinery during the year, and the nickel equivalent in oxides and salts sold, valued in the aggregate at the sum obtained from the sales of oxides and salts.

Table 143.—Production of Nickel from Canadian Ores, 1889-1928

Year	Pounds of nickel	Value	Year	Pounds of nickel	Value
		\$			\$
1889.....	830,477	498,286	1909.....	26,282,991	9,461,877
1890.....	1,435,742	933,232	1910.....	37,271,033	11,181,310
1891.....	4,035,347	2,421,208	1911.....	34,098,744	10,229,623
1892.....	2,413,717	1,399,956	1912.....	44,841,542	13,452,463
1893.....	3,982,982	2,071,151	1913.....	49,676,772	14,903,032
1894.....	4,907,430	1,870,958	1914.....	45,517,937	13,655,381
1895.....	3,888,525	1,360,984	1915.....	68,308,657	20,492,597
1896.....	3,397,113	1,188,990	1916.....	82,958,564	29,035,497
1897.....	3,997,647	1,399,176	1917.....	84,330,280	33,732,112
1898.....	5,517,690	1,820,838	1918.....	92,507,293	37,002,617
1899.....	5,744,000	2,067,840	1919.....	44,544,883	17,817,953
1900.....	7,080,227	3,327,707	1920.....	61,335,706	24,534,282
1901.....	9,189,047	4,594,523	1921.....	19,293,060	6,752,571
1902.....	10,693,410	5,028,903	1922.....	17,597,123	6,158,993
1903.....	12,505,510	5,002,204	1923.....	62,453,843	18,332,077
1904.....	10,547,883	4,219,153	1924.....	69,536,350	19,470,178
1905.....	18,876,315	7,550,526	1925.....	73,857,114	15,946,672
1906.....	21,490,955	8,948,834	1926.....	65,714,294	14,374,163
1907.....	21,189,793	9,535,407	1927.....	66,798,717	15,262,171
1908.....	19,143,111	8,231,538	1928.....	96,755,878	22,318,907
Total.....			1,314,547,402 427,583,190		

Table 144.—Production in Canada, Imports and Exports of Nickel 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	\$	Pounds	\$	Pounds	\$
PRODUCTION—						
Nickel in matte and speiss exported*.....	34,028,211	6,125,078	31,584,097	5,685,138	37,783,991	6,801,118
Refined and electrolytic nickel produced.....	25,627,602	6,423,401	28,469,996	7,497,436	49,144,875	12,596,371
Nickel in oxides and salts sold.....	6,058,481	1,825,684	6,744,624	2,079,597	9,826,712	2,921,418
Total.....	65,714,294	14,374,163	66,798,717	15,262,171	96,755,878	22,318,907
IMPORTS—						
Nickel, nickel silver and German silver, in ingots or blocks, n.o.p.....	12,253	4,897	1,549,692	547,138	217,112	79,001
Nickel in bars and rods, strips, sheets and plates.....	1,001,247	206,466	825,715	233,366	730,106	240,378
Nickel silver and German silver, in bars, rods, strips, sheets, plates or anodes.....	104,866	31,491	77,940	26,639	168,494	57,191
Nickel chromium, in bars and rods.....					50,990	52,738
German, Nevada and nickel silver, manufactures of, not plated.....		312,568		333,916		382,730
Nickel-plated household hollow-ware.....		17,461		81,562		85,138
Nickel-plated ware, n.o.p.....		1,526,959		2,113,246		2,451,421
Total nickel and its products.....		2,099,844		3,335,864		3,348,597
EXPORTS—						
Nickel, fine.....	24,698,400	6,386,387	29,015,800	7,896,211	51,188,700	13,320,034
Nickel contained in matte.....	39,177,400	6,074,497	36,458,800	5,784,623	36,370,800	5,457,222
Nickel in oxide.....			5,196,100	1,600,986	9,607,200	3,004,951
Total.....	63,875,800	12,460,884	70,670,700	15,281,820	97,166,700	21,782,237

*Nickel in matte and speiss exported valued at 18 cents per pound.

Table 145.—World Production of Nickel Ore, 1924-1928

(In terms of metal)

(From the Mineral Industry of the British Empire and Foreign Countries)

(Short tons)

Country	1924	1925	1926	1927	1928
British Empire—					
Canada.....	34,768	36,929	32,860	33,399	48,378
India (b).....			(a)	284	814
Australia.....				96	
Foreign countries—					
Italy.....	1	7			
Greece.....			30	28	(a)
Norway.....				179	451
United States (c).....	192	272	306	860	522
New Caledonia (d).....	4,032	3,718	4,220	3,543	2,063
World's Total.....	38,993	40,926	37,416	38,389	52,228

(a) Information not available.

(b) Nickel speiss obtained as a by-product in smelting operations.

(c) Nickel content of salts and nickel produced as a by-product in the electrolytic refining of copper.

(d) Nickel content of exports.

COPPER

CANADA

Copper production includes copper contained in ores and concentrates exported, copper in blister copper made, in matte exported and in copper sulphate made during the year.

Refined copper was produced commercially in quantity for the first time in Canada in 1916, at the Trail refinery of the Consolidated Mining and Smelting Company. The British America Nickel Corporation which produced refined copper at the Deschenes refinery for the first time in 1920, went into liquidation during July, 1924.

Table 146.—Production of Copper from Canadian Ores, 1886-1928

Year	Pounds	Value	Cents per pound	Year	Pounds	Value	Cents per pound
		\$				\$	
1886.....	3,505,000	385,550	11-00	1908.....	63,702,873	8,413,876	13-205
1887.....	3,260,424	366,798	11-25	1909.....	52,493,863	6,814,754	12-982
1888.....	5,562,864	927,107	16-66	1910.....	55,692,369	7,094,094	12-738
1889.....	6,809,752	936,341	13-75	1911.....	55,648,011	6,886,998	12-376
1890.....	6,013,671	947,153	15-75	1912.....	77,832,127	12,718,548	16-341
1891.....	9,529,401	1,226,703	12-87	1913.....	76,976,925	11,753,606	15-269
1892.....	7,087,275	818,580	11-55	1914.....	75,735,960	10,301,606	13-602
1893.....	8,109,856	871,809	10-75	1915.....	100,785,150	17,410,635	17-275
1894.....	7,708,789	736,960	9-56	1916.....	117,150,028	31,867,150	27-202
1895.....	7,771,639	836,228	10-76	1917.....	109,227,332	29,687,989	27-180
1896.....	9,393,012	1,021,960	10-88	1918.....	118,769,434	29,250,536	24-628
1897.....	13,300,802	1,501,660	11-29	1919.....	75,053,531	14,028,265	18-691
1898.....	17,747,136	2,134,980	12-03	1920.....	81,600,691	14,244,217	17-456
1899.....	15,078,475	2,655,319	17-61	1921.....	47,620,820	5,953,555	12-502
1900.....	18,937,138	3,065,922	16-19	1922.....	42,879,818	5,738,177	13-882
1901.....	37,827,019	6,096,581	16-117	1923.....	86,881,537	12,529,186	14-421
1902.....	38,804,250	4,511,383	11-626	1924.....	104,457,447	13,604,583	13-024
1903.....	42,634,454	5,649,487	13-235	1925.....	111,450,518	15,649,882	14-042
1904.....	41,383,722	5,306,635	12-823	1926.....	133,094,942	17,490,300	*
1905.....	48,092,753	7,497,660	15-590	1927.....	140,147,440	17,195,487	*
1906.....	55,609,888	10,720,474	19-278	1928.....	202,696,046	28,598,249	*
1907.....	56,979,205	11,398,120	20-004				
				Total.....	2,391,093,446	386,845,058	

*In 1926, 1927 and 1928 the value of Canada's copper production was computed according to the note on page 317.

Table 147.—Production of Copper in Canada, by Provinces and by Sources, 1927 and 1928

Production	1927		1928	
	Pounds	Value	Pounds	Value
By PROVINCES—		\$		\$
Quebec.....	3,119,848	403,084	33,697,949	4,909,791
Ontario.....	45,341,295	4,946,533	66,607,510	8,770,149
British Columbia.....	91,686,297	11,845,870	102,283,210	14,902,664
Yukon.....			*107,377	15,645
Total.....	140,147,440	17,195,487	202,696,046	28,598,249
By SOURCES—				
In blister copper produced.....	70,431,203	9,106,557	124,824,371	18,322,883
In copper sulphate produced.....	141,706	13,309	192,850	28,098
In ores exported.....	46,210,393	5,967,849	51,235,921	7,470,763
In nickel-copper matte exported.....	23,364,138	2,102,772	26,442,904	2,776,505
Total.....	140,147,440	17,195,487	202,696,046	28,598,249

*Copper in silver-lead ores exported during 1925-1928 inclusive.

Table 148.—Production of Refined Copper in Canada, 1916-1928

Year	Tons
1916.....	483
1917.....	3,901
1918.....	3,809
1919.....	3,467
1920.....	2,590
1921.....	2,143
1922.....	365
1923.....	824
1924.....	1,768
1925.....	170
1926.....	10,581
1927.....	9,191
1928.....	8,806

Table 149.—Production of Copper Sulphate in Canada, 1921-1928

Year	Pounds
1921.....	643,910
1922.....	230,835
1923.....	307,135
1924.....	127,301
1925.....	121,746
1926.....	404,862
1927.....	566,825
1928.....	771,400

The Consolidated Mining and Smelting Co. Ltd. of Trail, B.C., is the only company producing copper sulphate in Canada, the output being used by them in their own plant. Formerly the Coniagas Reduction Company at Thorold, Ontario, was also a producer.

QUEBEC

Production of copper from the province of Quebec included the estimated recovery of copper contained in concentrates shipped from the Consolidated Copper and Sulphur Company, Limited (formerly the Eustis mine) and the copper in blister copper made at the Noranda smelter from Quebec ores.

Table 150.—Production of Copper from Quebec Ores, 1886-1928

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1886.....	3,340,000	367,400	1901.....	1,527,442	246,178	1916.....	5,703,347	1,551,424
1887.....	2,937,900	330,514	1902.....	1,640,000	190,666	1917.....	5,015,560	1,363,229
1888.....	5,562,864	927,107	1903.....	1,152,000	152,467	1918.....	5,869,649	1,445,577
1889.....	5,315,000	730,813	1904.....	760,000	97,455	1919.....	2,691,695	503,105
1890.....	4,710,606	741,920	1905.....	1,621,243	252,752	1920.....	880,638	153,724
1891.....	5,401,704	695,469	1906.....	1,981,169	381,930	1921.....	352,308	44,045
1892.....	4,883,480	564,042	1907.....	1,517,990	303,659	1922.....		
1893.....	4,468,352	480,348	1908.....	1,282,024	169,330	1923.....		
1894.....	2,176,430	208,067	1909.....	1,088,212	141,272	1924.....	1,893,008	246,546
1895.....	2,242,462	241,288	1910.....	877,347	111,757	1925.....	2,510,141	352,474
1896.....	2,407,200	261,903	1911.....	2,436,190	301,503	1926.....	2,674,058	368,886
1897.....	2,474,970	279,424	1912.....	3,282,210	536,346	1927.....	3,119,848	403,084
1898.....	2,100,235	252,658	1913.....	3,455,887	527,679	1928.....	33,697,949	4,909,791
1899.....	1,632,560	287,494	1914.....	4,201,497	571,488			
1900.....	2,220,000	359,418	1915.....	4,197,482	725,115	Total.....	147,302,657	22,779,347

ONTARIO

Statistics of copper production in Ontario for 1928 included the copper contained in converter copper made at Port Colborne, Ontario, by the International Nickel Company, Limited, the copper in nickel-copper matte exported by the International Nickel Company, Limited, and the Mond Nickel Company, Limited; the recoverable copper in flotation concentrates exported by silver-cobalt and copper-lead-zinc mines, and the recoverable copper in concentrates exported by the Argonaut Gold mine.

The bounty offered by the Ontario government on copper 95 per cent pure and on copper sulphate produced from ore mined and refined in the province was never gained and the Act, known as the *Metal Refining Bounty Act* warranting the bounty, which expired April 10, 1917, was not re-enacted.

Table 151.—Production of Copper from Ontario Ores, 1886-1928

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1886.....	165,000	18,150	1901.....	8,695,831	1,401,507	1916.....	44,997,035	12,240,094
1887.....	322,524	36,284	1902.....	7,408,202	861,278	1917.....	42,867,774	11,651,461
1888.....			1903.....	7,172,533	949,285	1918.....	47,074,475	11,593,502
1889.....	1,466,752	201,678	1904.....	4,913,594	630,070	1919.....	24,346,623	4,550,627
1890.....	1,303,065	205,233	1905.....	8,779,259	1,368,686	1920.....	32,059,993	5,596,392
1891.....	4,127,697	531,234	1906.....	10,638,231	2,050,838	1921.....	12,821,385	1,602,930
1892.....	2,203,795	254,538	1907.....	14,104,337	2,821,432	1922.....	10,943,636	1,464,477
1893.....	3,641,504	391,461	1908.....	15,005,171	1,981,883	1923.....	31,656,800	4,565,227
1894.....	5,207,679	497,854	1909.....	15,746,699	2,044,237	1924.....	37,113,193	4,833,622
1895.....	4,576,337	492,414	1910.....	19,259,016	2,453,213	1925.....	39,718,777	5,577,311
1896.....	3,167,256	344,598	1911.....	17,932,263	2,219,297	1926.....	41,312,867	4,828,964
1897.....	5,500,652	621,023	1912.....	22,250,601	3,635,971	1927.....	45,341,295	4,946,533
1898.....	8,375,223	1,007,539	1913.....	25,885,929	3,952,522	1928.....	66,607,510	8,770,149
1899.....	5,723,324	1,007,877	1914.....	28,948,211	3,937,536			
1900.....	6,740,058	1,091,215	1915.....	39,361,464	6,799,693	Total.....	775,483,570	126,029,835

MANITOBA

During the years 1917 to 1920 the province of Manitoba was on record as one of the copper-producing provinces in Canada. The total production for the four years amounted to 9,866,328 pounds of copper having a total value of \$2,039,942. Production in each year was as follows: 1917—1,116,000 pounds, valued at \$303,329; 1918—2,339,751 pounds valued at \$576,234; in 1919—3,348,000 pounds valued at \$625,775; and in 1920—3,062,577 pounds valued at \$534,604. These amounts were estimated as the recoverable copper in ores shipped by the Mandy Mining Company operating near Schist lake in The Pas district of northern Manitoba. No copper ores were shipped during the years 1921 to 1928.

BRITISH COLUMBIA

British Columbia, the greatest copper-producing province of the Dominion, was credited in 1928 with a production of 102,283,210 pounds, the greatest of any year on record, as against 91,686,297 pounds in 1927. The output from this province amounted to 50 per cent of the total Canadian production for 1928 as against 66 per cent in 1927.

In this total there are included the quantities of blister copper produced at Anyox by the Granby Consolidated Mining, Smelting and Power Company; blister copper made by the Consolidated Mining and Smelting Company at Trail; copper contained in copper sulphate made by the same company; and the copper estimated as recoverable from ores and concentrates exported. The principal copper-producing mines in British Columbia are the Britannia mine on Howe Sound which ships its concentrates to Tacoma, Washington, U.S.A.; the Hidden Creek mine on Portland Canal; and the Copper Mountain Mine, owned and operated by the Granby Consolidated Mining, Smelting and Power Company, Limited. The Hidden Creek ores are smelted at the Anyox smelter and the Allenby concentrates, from Copper Mountain ore, were shipped to the Trail and Tacoma smelters. Small shipments were made from the Rossland mines to the smelter at Trail.

Table 152.—Production of Copper from British Columbia Ores, 1894-1928

Year	Pounds	Value	Year	Pounds	Value	Year	Pounds	Value
		\$			\$			\$
1894*	324,680	31,039	1906*	42,990,488	8,287,706	1918	62,865,681	15,482,560
1895*	952,840	102,526	1907*	40,832,720	8,168,177	1919	44,502,079	8,317,884
1896*	3,818,556	415,459	1908	37,041,115	4,892,390	1920	45,319,771	7,911,019
1897*	5,325,180	601,213	1909	35,658,952	4,629,245	1921	34,447,127	4,306,580
1898*	7,271,678	874,783	1910	35,270,006	4,492,693	1922	31,936,182	4,273,700
1899*	7,722,591	1,359,948	1911	35,279,558	4,366,198	1923	55,224,737	7,963,959
1900*	9,977,080	1,615,289	1912	50,526,656	8,256,561	1924	65,451,246	8,524,370
1901*	27,603,746	4,448,896	1913	45,791,579	6,991,916	1925	69,221,600	9,720,097
1902*	29,636,057	3,445,488	1914	41,219,202	5,606,636	1926	89,108,017	12,292,450
1903*	34,359,921	4,547,735	1915	56,692,988	9,793,714	1927	91,686,297	11,845,870
1904*	35,710,128	4,579,110	1916	63,642,550	17,312,046	1928	102,283,210	14,902,664
1905*	37,692,251	5,876,222	1917	57,730,959	15,691,275			
Total							1,435,117,428	231,927,418

*Metal content of ores shipped as published by the Provincial Bureau of Mines.

Table 153.—Production of Copper from Yukon Ores, 1906-1928

Year	Pounds	Value	Year	Pounds	Value
		\$			\$
1906 (and previous)	156,000	23,400	1915	533,216	92,113
1907	511,838	102,388	1916	2,807,096	763,586
1908	112,264	14,828	1917	2,460,079	668,650
1909			1918	619,878	152,663
1910	286,000	36,431	1919	165,184	30,874
1911			1920	277,712	48,478
1912	1,772,660	289,670	1921-1927		
1913	1,843,530	281,489	*1928	107,377	15,645
1914	1,867,050	185,946			
Total				13,019,884	2,706,161

*Includes small quantities produced in 1925, 1926 and 1927 but not reported until 1928.

Table 154.—Imports into Canada and Exports of Copper, 1926-1928

	1926		1927		1928	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
IMPORTS—						
Copper in bars or rods, when imported by manufacturers of trolley, telegraph and telephone wires, electric wires and electric cables for use only in the manufacture of such articles in their own factories.....	15,131,400	2,212,715	26,384,000	3,719,260	36,063,400	5,537,148
Copper in lars or rods, in coil or otherwise, in lengths of not less than 6 feet, unmanufactured.....	2,627,000	490,222	732,100	128,144	539,300	102,740
Copper in blocks, pigs or ingots.....	8,599,699	1,231,422	3,795,607	510,771	7,883,600	1,176,941
Copper, old and scrap.....	3,039,400	408,999	5,817,100	737,029	5,606,300	785,141
Copper, ore and concentrates.....	1,700	927	500	530	100	52
Copper, in strips, sheets or plates not polished or coated.....	1,882,400	406,988	1,836,700	385,477	2,586,700	521,559
Copper tubing in lengths of not less than 6 feet, and not polished, bent or otherwise manufactured.....	2,535,796	579,044	2,124,343	506,745	2,549,901	602,730
Copper wire, plain, tinned or plated.....	420,361	111,504	434,372	108,662	827,059	217,735
Copper wire cloth, or woven wire of copper.....		51,390		19,580		14,128
Copper wire, single or several, covered with cotton, linen, silk, rubber or other material, including cable so covered.....		502,395		509,312		677,923
Copper, all other, manufactures of, n.o.p. Copper, precipitate of, crude.....		578,068		644,534		1,074,156
Anodes of nickel, zinc, copper, silver or gold.....		4,806		10,050	3,825	102
Copper, sub-acetate of, or verdigris, dry.....	31,755	2,260	3,389	638	410	15,853
Copper, sulphate of (blue vitriol).....	3,385,239	158,992	4,110,695	198,553	3,741,971	190,515
Copper, sulphate of, dehydrated, for agricultural or spraying purposes.....	229,288	11,896	536,426	29,696	1,627,074	84,130
Copper rollers adapted for use in calico printing.....		350		5,526		21,003
Total.....		6,752,068		7,514,557		11,021,950
EXPORTS—						
Copper, fine, contained in ore, matte regulus, etc.....	67,108,300	7,822,260	72,841,200	7,371,542	76,427,900	7,023,884
Copper, blister.....	45,256,300	6,055,266	54,258,800	6,667,270	104,764,700	15,375,344
Copper, old and scrap.....	5,972,400	614,108	5,912,500	602,494	8,061,700	869,839
Copper, pig.....	58,200	7,127	11,200	1,734		
Copper in bars, rods, strips, sheets, plates and tubing.....	256,900	72,475	248,100	63,165	158,200	40,988
Copper wire and cable.....		380,311		199,817		259,430
Copper mfrs., n.o.p.....		57,312		46,757		25,930
Total.....		15,008,859		14,952,779		23,595,415

Table 155.—Monthly Average Prices of Copper (Electrolytic), New York and London, 1926-1928

(From the Engineering and Mining Journal)

	New York (In cents per pound)			London (£Sterling per long ton)		
	1926	1927	1928	1926	1927	1928
January.....	13-822	12-990	13-854	65-325	62-375	66-575
February.....	13-999	12-682	13-823	66-375	61-119	66-381
March.....	13-859	13-079	13-845	65-489	62-641	66-413
April.....	13-706	12-808	13-986	64-600	61-526	66-500
May.....	13-599	12-621	14-203	64-313	60-881	67-216
June.....	13-656	12-370	14-527	64-591	59-881	68-738
July.....	13-924	12-532	14-527	65-625	60-089	68-670
August.....	14-174	12-971	14-526	66-857	62-227	68-750
September.....	14-062	12-940	14-724	66-528	61-830	69-800
October.....	13-862	12-958	15-202	66-298	62-256	71-935
November.....	13-756	13-319	15-778	65-551	63-761	74-750
December.....	13-302	13-774	15-844	64-114	66-181	75-000
Average.....	13-795	12-920	14-570	65-472	62-064	69-230

Table 156.—(a) World Production of Copper 1913 and 1924-1928

(From the Year Book of the American Bureau of Metal Statistics, 1922 and 1928.)

(Short tons)

Country	1913	1924	1925	1926	1927	1928
NORTH AMERICA—						
United States.....	614,255	819,000	854,000	878,000	847,419	935,199
Mexico.....	58,185	57,139	59,123	62,303	63,760	72,579
Canada (b).....	38,460	50,072	56,239	64,124	70,668	96,634
Cuba.....	3,747	12,742	13,128	13,034	15,538	18,869
Total, North America.....	714,647	938,953	982,490	1,017,461	997,415	1,123,281
SOUTH AMERICA—						
Bolivia.....	4,077	8,200	7,500	7,100	7,850	7,500
Chile.....	46,574	208,964	212,150	223,015	264,242	319,549
Peru.....	30,609	37,410	40,635	48,327	52,665	57,830
Venezuela.....		1,230	1,500	1,000	150	
Total, South America.....	81,260	255,804	261,785	279,442	324,937	384,879
EUROPE—						
Austria-Hungary (c).....	4,518	4,242	3,665	4,099	3,968	3,638
France.....		2,568	3,769	2,370	2,612	2,535
Germany.....	27,881	25,132	26,235	26,455	31,526	26,455
Jugo-Slavia.....		8,878	8,048	10,692	14,220	16,629
Norway.....	3,021	10,913	13,779	13,779	13,227	14,475
Russia.....	37,358	3,637	9,967	11,943	*13,227	*14,390
Spain and Portugal.....	39,683	61,839	63,933	63,933	60,351	59,427
Sweden.....	4,645	3,086	2,500			1,000
Serbia.....	7,053					
Total, Europe.....	124,159	120,395	131,896	133,271	139,131	138,489
ASIA—						
Japan.....	73,282	69,507	73,289	74,256	73,381	72,796
Other, Asia.....		2,315	3,600	6,100	6,100	5,600
Total, Asia.....	73,282	71,822	76,889	80,356	79,481	78,396
AUSTRALASIA.....	49,901	15,711	13,578	11,244	12,800	12,846
AFRICA.....	25,236	115,300	118,670	108,010	123,470	141,131
OTHER COUNTRIES.....	4,188	*4,409	*4,409	*4,409	*4,409	*4,409
Grand total.....	1,072,674	1,522,394	1,589,717	1,634,193	1,681,643	1,883,431

(a) So far as possible, these statistics are based on blister copper, referred to countries wherein ore originated.

(b) For Dominion Bureau of Statistics figures on Canada's production of copper, see Table 1

(c) After 1918, Austria only.

*Conjectural.

METALS OF THE PLATINUM GROUP

Metals of the platinum group produced from Canadian ores include platinum, palladium, rhodium, iridium, etc., recovered in the refining of nickel-copper matte from the Sudbury district; minor quantities of platinum from British Columbia placers and some platinum and palladium recovered from ores smelted at Trail, British Columbia.

Canada stands third in the world's production of these metals, larger amounts coming from Russia, and Colombia, South America. In British Columbia, small quantities of platinum are found in placer deposits with alluvial gold and black sands; in Ontario these rare metals occur with the nickel-copper-sulphide ores of the Sudbury district. Copper-nickel matte containing the precious metals is made at Coniston by the Mond Nickel Company, Limited, and at Coppercliff by the International Nickel Company, Limited. The International matte is shipped either to the United States, for manufacture into monel metal, or to Port Colborne, Ontario, for refining. When the copper and nickel are removed, the residues are further refined for the recovery of gold, silver, platinum and palladium and smaller amounts of rhodium and iridium. The Mond matte is shipped to Clydach, Wales, where the metals of the platinum group are recovered in the refining process.

Table 157.—Production of the Platinum Group Metals in Canada, 1927 and 1928

	Platinum		Palladium, Rhodium Iridium, etc.	
	Ounces	Value	Ounces	Value
1927		\$		\$
Ontario.....	11,217	716,653	11,545	554,190
British Columbia.....	11	960		
Total.....	11,228	717,613	11,545	554,190
1928				
Ontario.....	10,452	704,360	13,087	605,563
British Columbia.....	80	4,549	520	22,270
Total.....	10,532	708,909	13,607	627,833

Table 158.—Production of Platinum in Canada from Alluvial Sands, 1887-1928

Year	Value	Year	Value	Year	Fine ounces	Value
	\$		\$			\$
1887.....	5,600	1897.....	1,609	1913.....	18	489
1888.....	6,000	1898.....	1,500	1914.....		
1889.....	3,500	1899.....	825	1915.....	23	1,063
1890.....	4,500	1900.....		1916.....	15	600
1891.....	10,000	1901.....	457	1917.....	57	3,823
1892.....	3,500	1902.....	190	1918.....	39	2,506
1893.....	1,800	1903.....		1919.....	25	2,105
1894.....	950	1904.....	420	1920.....	17	791
1895.....	3,800	1905.....	500	1921.....	23	1,558
1896.....	750	1906.....		1922.....	12	1,154
		1907-1912.....		1923.....	7	816
				1924.....	5	569
				1925.....	6	715
				1926.....		
				1927.....	11	960
				1928.....	49	2,819

Table 159.—Production of Metals of the Platinum Group, 1887-1928

Year	Platinum				Palladium	
	Lode		Placer		Fine oz.	\$
	Fine oz.	\$	Fine oz.	\$		
1887.....				5,600		
1888.....				6,000		
1889.....				3,500		
1890.....				4,500		
1891.....				10,000		
1892.....				3,500		
1893.....				1,800		
1894.....				950		
1895.....				3,800		
1896.....				750		
1897.....				1,600		
1898.....				1,500		
1899.....				825		
1900.....				Nil		
1901.....				457		
1902.....	(a) 2,375	46,312	(d) 10	190	4,411	86,014
1903.....	(a) 1,710	33,345			3,177	61,952
1904.....	(a) 530	10,452		420	952	18,554
1905.....	(b) 559	11,370		500	1,003	16,746
1906.....	(b) 112	3,140			202	2,512
1907.....	(c) 227	7,032			(c) 607	
1908.....	(c) 172	2,807			(c) 328	
1909.....	(c) 547	13,604			(c) 1,271	
1910.....	(c) 258	8,437			(c) 523	
1911.....	(c) 666	28,718			(c) 753	
1912.....	(c) 497	22,638			(c) 680	
1913.....	(c) 193	8,662	(d) 18	489	(c) 208	
1914.....	(c) 748	33,765			(c) 756	
1915.....	(c) 452	21,303	(d) 23	1,063	(c) 543	
1916.....	(c) 1,017	84,818	(d) 15	600	(c) 1,345	
1917.....	(c) 971	99,838	(d) 57	3,823	(c) 1,354	
1918.....	(c) 650	68,868	(d) 39	2,560	(c) 787	
1919.....	(c) 617	70,714	(d) 25	2,150	(c) 762	
	(d) 25	1,447			(d) 62	3,534
1920.....	(c) 489	31,296			(c) 739	
	(d) 89	5,665	17	719	(d) 174	11,096
1921.....		21,014	23	1,585	590	26,613
1922.....	458	44,709	12	1,154	724	47,060
1923.....	1,210	141,010	7	816	1,732	138,560
1924.....	9,181	1,080,858	5	569	8,923	811,993
1925.....	8,692	1,027,477	6	715	7,856	608,727
1926.....	9,471	919,349	50	4,258	9,790	626,166
1927.....	11,217	716,653	11	960	11,247	541,319
1928.....	10,483	706,090	49	2,819	11,909	511,998

Year	Rhodium		Ruthenium		Osmium		Iridium	
	Fine oz.	\$	Fine oz.	\$	Fine oz.	\$	Fine oz.	\$
1907.....	(e)		(e)		(e)		(e)	
1908.....	(e)		(e)		(e)		(e)	
1909.....	(e)		(e)		(e)		(e)	
1910.....	(e)		(e)		(e)		(e)	
1911.....	(e)		(e)		(e)		(e)	
1912.....	(e)		(e)		(e)		(e)	
1913.....	(f) 191							
1914.....	(f) 516							
1915.....	(f) 57							
1916.....	(f) 257							
1917.....	(f) 325							
1918.....	(f) 473							
1919.....	227				(f) 77			
1920.....	390				(f) 102			
	20	1,249						
1921.....	256	3,433			(f) 11			
	56							
1922.....	104				(f) 391	31,280		
1923.....	206	18,540					98	26,460
1924.....	367	27,500	78	2,106	69	4,924	79	16,590
1925.....					(f) 432	40,242		
1926.....	204	9,969	16	791			14	3,252
1927.....	222	6,853	31	1,073			45	4,945
1928.....	895	20,951	561	16,331			242	78,553

(a) Includes recovery from residue from matte treated in previous years.

(b) In 1905, platinum group metals production was 1,562 oz. worth \$28,116. In 1906 it was 314 ounces worth \$5,652. Figures in table estimated from these figures.

(c) Recovery of platinum group metals at International Nickel Company's plant, New Jersey, U.S.A. Not necessarily all from Sudbury ores.

(d) Crude oz.

(e) Included with platinum and palladium.

(f) Includes osmium, iridium and ruthenium.

Platinum is recovered in a small way at the Royal Mint in the form of platinum black a dull black powder of metallic platinum, obtained from the treatment of dental and old jewellery scrap. The following tables show the recoveries since 1923.

Table 160.—Recovery of Platinum Black, at the Royal Mint, Ottawa, 1923-1928

	Platinum	
	Ounces gross	Value
		\$
1923.....	4·520	393·47
1924.....	16·186	1,408·99
1925.....	9·500	*
1926.....	10·700	*
1927.....	54·150	*
1928.....	16·350	*

*No sales.

Table 161.—Imports into Canada and Exports of Platinum, 1926-1928

	1926		1927		1928	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$
IMPORTS—						
Crucibles.....		8,960		8,581		10,838
Wire and bars, strips, sheets or plates...		138,433		94,538		136,777
Retorts, pans, condensers, etc.....		40,028		26,901		2,881
Total.....		187,421		130,020		150,496
EXPORTS—						
Ores and concentrates.....	520	54,747	771	52,660	1,212	77,908
Old and scrap.....	396	40,185	221	15,789	424	27,463
Total.....		94,932		68,449		105,371

Table 162.—Monthly Average Prices of Platinum, 1926-1928

(From *The Engineering and Mining Journal*)

(In dollars per fine ounce)

Month	1926	1927	1928
	\$	\$	\$
January.....	118·200	109·520	79·280
February.....	113·909	107·545	84·783
March.....	112·000	108·000	80·000
April.....	111·538	101·885	80·000
May.....	108·960	84·680	78·000
June.....	111·000	72·000	78·000
July.....	114·692	72·000	78·000
August.....	116·000	72·000	78·000
September.....	116·840	72·000	78·000
October.....	112·240	72·000	78·000
November.....	112·000	72·000	76·417
December.....	111·846	72·000	74·480
Average.....	113·269	84·636	78,580

Table 163.—Platinum Metals Consumed in the United States as Reported by Refiners and by Industries, 1927 and 1928(From *Mineral Resources of the United States*, 1928.)

(In Troy ounces)

Industry	Platinum	Palladium	Iridium	Others	Total	Percentage of total
1927						
Chemical.....	11,010	180	101	175	11,466	8
Electrical.....	14,905	2,491	1,618	121	19,135	13
Dental.....	7,504	12,194	153	.....	19,851	13
Jewellery.....	86,036	3,706	4,059	329	94,130	63
Miscellaneous.....	3,176	312	305	1,311	5,104	3
Total.....	122,631	18,883	6,236	1,936	149,686	100
1928						
Chemical.....	18,529	1,252	113	135	20,029	10.68
Electrical.....	21,316	9,150	1,525	2	31,993	17.07
Dental.....	10,930	12,270	167	10	23,377	12.47
Jewellery.....	93,468	4,965	3,260	815	102,508	54.77
Miscellaneous.....	5,431	2,136	963	850	9,380	5.01
Total.....	149,674	29,773	6,028	1,812	187,287	100.00

Table 164.—World Production of Platinum (a), 1912-1928

(In troy ounces, fine platinum)

(From *The Mineral Industry* 1928)

Year	Australia	Canada (b)	Colombia	Japan	Russia	South Africa (f)	United States (b)	Total
1912.....	463	497 (d)	27,071	.....	(c) 250,000	.....	1,005	279,036
1913.....	335	311 (d)	17,635	.....	(c) 210,000	.....	1,034	229,315
1914.....	185	..... (d)	16,264	.....	(c) 202,000	.....	1,484	219,933
1915.....	43	475 (d)	18,749	.....	(c) 104,000	.....	(e) 1,190	124,500
1916.....	62	1,040 (d)	25,592	.....	(e) 53,000	.....	(e) 2,780	82,500
1917.....	197	1,036 (d)	26,421	.....	98,474	.....	(e) 6,280	132,400
1918.....	461	705 (d)	34,266	1,575	43,181	.....	(e) 9,740	89,928
1919.....	162	690 (d)	32,236	4,830	39,425	.....	(e) 10,460	87,893
1920.....	640	4,345 (c)	33,500	8,014	11,323	.....	(e) 11,500	69,300
1921.....	189	5,412 (c)	34,000	7,196	5,500	.....	2,899	55,200
1922.....	61	4,802 (d)	43,574	4,665	22,500	.....	1,998	77,600
1923.....	445	6,810 (d)	40,676	6,956	34,700	.....	2,114	91,700
1924.....	490	9,186 (d)	46,533	4,519	56,900	.....	3,523	121,200
1925.....	573	8,698	38,291	5,873	94,800	5,490	4,325	158,100
1926.....	397	9,521	46,714	6,169	92,700	16,773	4,923	177,200
1927.....	226	11,217 (e)	55,000 (e)	1,459 (e)	100,000	25,043	4,449 (e)	197,500
1928.....	.....	10,452	.....	.....	.....	(e) 29,100	4,631 (e)	200,000

(a) Estimated content of fine platinum contained in crude platinum output. There has been a small production in some years from India, Borneo, Japan and other countries, but none of importance.

(b) Platinum of domestic source recovered by refiners. For total Canadian production see table 159.

(c) Estimated by J. M. Hill, U.S. Bureau of Mines.

(d) Exports.

(e) Estimated.

(f) All platinum group metals.

CHAPTER SIX

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics,
Showing Production by Provinces, Imports, Exports, Prices and World Output Tables
on Aluminium, Antimony, Chromite, Iron Ore, Pig Iron and Ferro-Alloys,
Steel and Rolled Products, Manganese, Mercury, Molybdenum,
Tin and Tungsten.

1. General Review

Several metallic minerals, produced in each case by a single operator, or perhaps by a few operators, only, have been grouped in this report for consideration as a single industry. There is little that can be said in a general way about these various producers. Iron and steel, and aluminium are products of large, well-organized concerns, but both of these products are made in Canada solely from imported ores. Aluminium smelting is, therefore, of interest to the mining industry wholly because of the processes employed in the reduction of the metal from bauxite ore. Iron ore is found in Canada in very extensive deposits, but as the grade available cannot be economically used without beneficiation, very little Canadian ore has been mined in recent years. Imported iron ore used in Ontario is mostly from the Mesabi range, Minnesota, U.S.A., while in the Maritime provinces, Wabana ore, mined on Bell Island, Newfoundland, is chiefly used.

Other metallic mineral industries reviewed in this chapter, include the production of antimony, chromite, manganese, mercury, molybdenum, tin and tungsten but these enterprises are relatively small, and their importance is largely determined by the extent of available supplies from other countries. When, as during the great war, production from other sources was insufficient to meet the increased demands for such products as chromite and manganese, the output from Canadian deposits found ready markets. At other times, with larger supplies available, from various sources, operation of the Canadian properties has been found somewhat difficult because of the keen competition of other producers.

During the great war, some of these smaller industries attained very considerable importance, and it is always possible, that some commercial development may occur that will lead once, again, to appreciable expansion in these somewhat neglected fields.

For historical purposes and to provide the interested reader with the available data, tables have been prepared for this report that set out the known facts regarding production in these industries.

In 1928 the miscellaneous group included one titaniferous iron ore property in Quebec, one developing molybdenite property in Quebec, one developing antimony mine in New Brunswick, and one developing tungsten property in Nova Scotia and one cinnabar prospect in British Columbia.

Table 165.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1927 and 1928

	1927			1928		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
Salaried Employees—						
Total.....	5		2,900	4	1	7,850
Wage-Earners—						
Surface.....	40		20,984	35		54,036
Underground.....	20			22		
Total.....	60		20,984	57		54,036
Total.....	65		23,944	61	1	61,886

Table 166.—*Wage-Earners in the Miscellaneous Metal Mining Industries in Canada, by Months, 1927 and 1928

Month	1927				1928			
	Number of wage-earners				Number of wage-earners			
	Surface	Underground	Mill	Total	Surface	Underground	Mill	Total
January.....					14	4		18
February.....					24	16		40
March.....	3	2		5	24	16		40
April.....	5	4		9	21	15		36
May.....	7	6		13	21	13		34
June.....	10	10		20	30	22		52
July.....	10	10		20	29	22		51
August.....	14	5		19	24	12		36
September.....	25	13		38	32	12		44
October.....	36	10		46	37	12		49
November.....	38	9		47	26	12		38
December.....	18	14		32	19	4		23

*See note page 31.

2.—Commodity Statistics on Aluminium, Antimony, Bismuth, Cadmium, Chromite, Iron Ore, Pig Iron, Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten.

ALUMINIUM

While, so far, no commercial ores of aluminium have been discovered in Canada, production of aluminium from imported ores, mostly mined in the United States, has been carried on in Canada at Shawinigan Falls, Quebec, since 1903, and in 1926 a new plant was built at Arvida near Lake St. John on the upper reaches of the Saguenay to increase the output of this metal by the only Canadian producer, the Aluminium Company of Canada. Both plants still use bauxite from the United States but it is expected that the Arvida plant, because of its accessibility to tide-water, will be able to bring in its raw material more cheaply by water from British Guiana than is now possible by rail, from United States mines.

As there is only one producing company in this industry, statistics regarding the smelting operations have been included with data supplied by the smelters producing non-ferrous metals from Canadian ores. Production of aluminium hollowware, such as kitchen utensils, and other fabricated products, is reviewed annually in the Bureau's report on the *Manufactures of the Non-Ferrous Metals*.

Aluminium is a product of the electric furnace. Alumina, which has previously been recovered by chemical means from bauxite, is dissolved in molten cryolite, in an electric furnace and a low voltage current is passed through the melt to decompose the oxide into metallic aluminium and oxygen; the metal sinks to the bottom of the crucible. The free oxygen attacks the carbon of the furnace electrode forming carbon dioxide gas and for this reason the electrode consumption is high. Theoretically, there should be no loss of cryolite but in actual operations losses occur, which must be made good from time to time. All cryolite ore is obtained from Greenland. The chief uses of aluminium are in the manufacture of alloys with other metals including copper, nickel, cobalt, iron, antimony, tin, zinc and magnesium, and there are many uses for the pure metal itself. Pure aluminium powder is used in the thermit process to reduce the oxides of certain metals to the metallic state. In the manufacture of some alloys, metals of low carbon content are required and in the preparation of these metals from their oxides, reduction by aluminium is found very desirable, and a great improvement over the older method of reduction by carbon. Powdered aluminium is also used in precipitation of gold and silver from cyanide solutions and because of its great affinity for oxygen, it is sometimes employed as a de-gasifier or a de-oxidizer in the manufacture of steel.

Table 167.—Imports of Aluminium and its Products into Canada and Exports of Aluminium, 1926-1928

	1926		1927		1928	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
IMPORTS—						
Alumina.....	145,145,500	3,118,205	253,235,300	6,036,019	65,748,300	1,494,545
Bauxite ore†.....					261,767,100	2,842,237
Cryolite ore.....	6,400,900	369,688	2,448,300	164,437	6,926,500	297,629
Aluminium—						
Ingots or blocks†.....					119,018	29,340
Bars and rods†.....					179,474	59,523
Sheets, strips or plates†.....					646,552	190,584
Ingots, blocks, bars, rods, strips, sheets or plates*.....	962,417	270,517	1,114,511	331,335	451,166	136,362
Leaf or foil.....		202,547		260,936		233,011
Tubing.....	76,113	42,003	97,644	50,128	87,468	46,430
Net floats for sea or lake fishing only†.....						637
Household hollow-ware.....		268,268		271,680		284,740
Manufactures, n.o.p.....		598,790		780,676		1,110,090
Total.....		4,870,018		7,895,211		6,725,128
EXPORTS—						
Aluminium—						
Bars, blocks, etc.....	25,177,000	5,900,547	51,902,400	10,544,195	40,597,100	8,049,367
Kitchen utensils and hollow-ware†.....						46,384
Scrap.....	353,800	50,888	543,500	66,534	1,800,300	249,066
Manufactures, n.o.p.....		1,188,260		403,230		712,874
Total.....		7,139,695		11,013,959		9,057,691

†April 1 to December 31, 1928.

*January 1 to March 31, 1928.

Table 168.—Monthly Average Prices of Ingot Aluminium, 1926-1928

(At New York in cents per pound 98 per cent grade)

(From the *Engineering and Mining Journal*)

Month	1926	1927	1928
January.....	27.000	26.270	24.300
February.....	27.000	26.000	24.300
March.....	27.000	26.000	24.300
April.....	27.000	26.000	24.300
May.....	27.000	26.000	24.300
June.....	27.000	26.000	24.300
July.....	27.000	26.000	24.300
August.....	27.000	26.000	24.300
September.....	27.000	26.000	24.300
October.....	27.000	25.600	24.300
November.....	27.000	25.000	24.300
December.....	26.934	24.785	24.300
Average.....	26.955	25.808	24.300

Table 169.—World Production of Aluminium, 1913 and 1924-1928

(From *The Mineral Industry*, 1928)*

(Metric tons)

Country	1913	1924	1925	1926	1927	1928
Austria.....	5,000	3,000	4,000	2,700	3,000	3,000
Canada.....	5,916	16,000	17,000	18,000	27,000	24,000
France.....	13,503	16,315	18,403	21,000	20,000	30,000
Germany.....	800	18,400	25,000	30,000	31,700	33,000
Great Britain.....	10,000	8,000	9,500	7,000	7,300	8,000
Italy.....	874	2,058	1,880	1,929	1,800	3,350
Norway.....	2,500	19,953	21,301	24,429	21,000	21,000
Switzerland.....	10,000	19,000	20,000	20,000	20,000	22,000
United States.....	29,500	68,000	66,000	68,000	72,000	82,000
Total.....	78,093	170,726	183,692	193,658	203,800	226,850

* The data in this table are as estimated by Robt. J. Anderson.

Table 170.—World Production of Bauxite, 1913 and 1924-1928

(From *The Mineral Industry*, 1928)

(Metric tons)

Country	1913	1924	1925	1926	1927	1928
Austria.....	(b)	3,000	(b) 4,000	(b) 5,000	(c)	(e)
British Guiana.....		188,071	197,458	222,518	192,986	(b) 167,000
British India.....	1,203	23,602	10,232	4,956	4,370	(b) 4,500
Dutch Guiana.....		60,025	85,501	46,400	169,700	(b) 200,000
France.....	309,285	335,489	406,421	408,600	540,000	597,810
Germany.....		3,084	1,767	(b) 15,000	2,400	(b) 3,000
Hungary.....		(c)	(c)	90,500	287,950	(b) 300,000
Italy (e).....	6,953	140,750	198,000	(b) 5,000	95,300	148,000
Jugo-Slavia.....		(b) 30,000	79,010	(b) 150,000	100,327	(b) 46,000
Rumania.....			(b) 7,000	745	1,706	(c)
Ireland.....	8,417	5,241	5,120	(b) 6,000	5,394	(b) 5,000
United States.....	213,675	352,117	321,622	398,546	326,289	381,454
Total.....	539,533	1,141,379	1,316,131	1,353,265	(b) 1,726,422	(b) 1,852,764

(b) Estimated. (c) Data not available. (d) The bauxite deposits in the Bihar Mountains in Rumania were not exploited until war when they were owned by Hungary. (e) Istria included under Italy.

ANTIMONY

No antimony ore has been produced in Canada since 1917. Ores of antimony are known to occur in British Columbia, New Brunswick, Nova Scotia, Ontario, Quebec and the Yukon. The greater part of the Canadian output of refined antimony was produced in the years 1907, 1909, 1915 and 1916 by the Consolidated Mining and Smelting Company of Trail, B.C., as a by-product in the treatment of silver-lead ores. The remainder was from the New Brunswick ores treated locally.

There is an occurrence of stibnite ore and native antimony associated with arsenopyrite, pyrite and galena that was worked at West Gore, Hants county, Nova Scotia, during the war period, the ore being concentrated at the mine to a 38 to 45 per cent antimony content.

No antimony was produced in 1928, but 1,596 pounds worth \$281, were recovered in 1926 from silver-lead-bismuth bullion obtained in the treatment of ores from the Cobalt district, exported for refining in the United States.

About 1850, stibnite and small quantities of native antimony were discovered in the slates and quartzites of Prince William, York county, New Brunswick. Attempts to smelt the ore locally failed, and for a time, the crude ore was shipped but this proved unprofitable and work was discontinued in 1890. In 1907 the deposit was re-worked and during the war period the ore was smelted and refined near lake George.

Antimony ores are rare in the province of Ontario, although it has been found in Hastings, Addington and Frontenac counties and with the silver of the Cobalt district. In South Ham, Wolfe county, Quebec, some work has been done on an antimony deposit.

There are several deposits of antimony in British Columbia. In the Bridge river area, Lillooet Mining Division, stibnite occurs in quartz. The ore contains, on the average, 40 to 50 per cent antimony, free from arsenic, zinc and lead; it also carries gold varying from a trace to one-half an ounce to the ton. A few shipments have been made from a deposit on the north fork of Carpenter creek in the Slovan district.

Antimony has also been found on Graham island, at Tatlayoko lake, Nanaimo district, and in the vicinity of Kamloops lake where it is associated with cinnabar.

In the Yukon territory antimony ores occur in the Carbon and Chieftain Hills near the Wheaton river.

Table 171.—Production of Antimony in Canada, 1886-1928

Year	Antimony ore		Refined regulus		Antimony in silver-lead-bismuth bullion exported	
	Tons	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
1886.....	665	31,490				
1887.....	584	10,860				
1888.....	345	3,098				
1889.....	55	1,100				
1890.....	20½	625				
1891.....	10	60				
1892-1897.....						
1898.....	1,344	20,000				
1899-1904.....						
1905 (a).....	527					
1906 (a).....	782					
1907.....	2,016	65,000	63,850	5,108		
1908 (b).....	148	5,443				
1909.....	35	1,575	61,207	4,285		
1910.....	364	13,906				
1911-1914.....						
1915.....	1,341	81,283	59,440	11,888		
1916.....	885	94,537	107,185	41,823		
1917.....	361	22,000				
1918-1924.....						
1925.....					1,751	206
1926.....					1,596	281
1927.....						
1928.....						

(a) As recorded by the Nova Scotia Department of Mines; no value given.

(b) Exports.

Table 172.—Imports of Antimony into Canada, 1926-1928

	1926		1927		1928	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Antimony, or regulus of.....	1,139,748	183,127	1,281,483	143,446	1,529,823	140,958
Antimony salts.....	31,056	6,697	37,975	8,233	16,930	3,837
Antimony salts for dyeing.....	3,712	1,047	14,734	2,533	6,096	1,490
Total.....		190,871		154,212		146,285

Table 173.—Monthly Average Prices of Antimony, 1926-1928

(Compiled from quotations given in the *Engineering and Mining Journal*—"Ordinaries" stand for Hungarian, Chinese or other "Foreign" brands)

(At New York in cents per pound)

Month	1926	1927	1928
	Ordinaries	Ordinaries	Ordinaries
January.....	23.490	13.910	10.863
February.....	21.676	14.509	10.842
March.....	19.703	12.801	10.083
April.....	17.492	14.166	9.865
May.....	12.170	12.975	11.019
June.....	11.100	12.447	9.750
July.....	14.490	11.880	9.540
August.....	15.957	11.826	10.181
September.....	15.325	11.073	10.813
October.....	13.943	11.165	10.841
November.....	13.385	10.733	10.109
December.....	13.142	11.195	9.748
Average.....	15.988	12.393	10.335

World Production of Antimony.—China is by far the greatest antimony-producing country in the world, and as consumption of antimony in that country is only 1 per cent of its production, large quantities are available for export. There are many valuable deposits in the various provinces of China, but in the province of Hunan alone there is said to be 2,000,000 tons, much of which has not been developed.

Table 174.—World's Production of Antimony, 1913 and 1924-1928

(From *The Mineral Industry*)

(In metric tons of recoverable metal content of ore, exclusive of antimonial lead ores)

Country	1913	1924	1925	1926	1927	1928 (c)
North America:						
Canada.....			1	1		
Mexico.....	2,340	775	1,398	2,614	1,924	3,578
United States.....		24	24	31		42
South America:						
Argentina.....		(b) 120	(a) 10	(c) 3,260	(c)	(c)
Bolivia (a).....	30	621	1,384	3,260	3,593	3,544
Peru.....			8	47	(c)	(c)
Europe:						
Austria-Hungary.....	840					
Austria.....	1,038	1		87	(c)	1,143
Czechoslovakia.....		1,066	578	1,154	1,951	1,208
France.....	5,170	1,021	648	580	1,470	2,166
Germany.....				56		
Hungary.....				(c)	(c)	(c)
Italy.....	360	372	312	443	500	286
Jugoslavia.....		414	139	182	147	129
Portugal.....	10	14	15	(c)	(c)	(c)
Serbia.....	250					
Spain.....				14	(c)	(c)
Asia:						
China (a).....	13,032	12,059	19,496	20,028	(d) 21,000	22,347
India.....						376
Indo-China.....						
Japan.....	20					
Turkey (Asia Minor) (a).....	240	400	400	400	400	498
Africa—						
Algeria (a).....	186	905	1,461	334	50	
British South Africa.....	30					
Southern Rhodesia.....						50
Australia:						
New South Wales.....	10		12	34	(c)	(c)
Queensland.....						
Victoria.....	960	130	54			

(a) Exports.

(b) Railway shipments. A large part of the shipments reported is probably of Bolivian origin and therefore may duplicate in part the quantities shown for Bolivia.

(c) Data not available.

(d) Estimated.

BISMUTH

Bismuth occurs in small quantities with ores of the Cobalt district. Some bismuth was recovered as metal in 1928 and some contained in silver-lead-bismuth bullion, was exported for treatment in United States smelters. During 1928 production of metallic bismuth and bismuth contained in exports amounted to 14,002 pounds valued at \$5,067.

"The Mineral Industry, 1927" makes the following statements regarding uses for bismuth.

While a very large portion of the bismuth metal produced finds its way into pharmaceutical compounds, we find that all the manufacturers buy the pure metal, and from it prepare the bismuth compounds used in making their preparations.

Outside of its pharmaceutical uses the only other important demand for the metal comes from the makers of so-called "fusible alloys." These are prepared according to many formulae, but almost always contain large amounts of bismuth.

Quaternary alloys containing lead, tin, cadmium, and bismuth can be produced having fusion points below 100°C., and by varying the proportions any desired fusion point may be obtained. Such alloys are much used as solders for making fusible links for automatic sprinklers and firedoors.

Table 174a.—World Production of Bismuth, 1924-1928

(From *The Mineral Industry*)

(Pounds)

Country	1924	1925	1926	1927	1928
BRITISH EMPIRE					
Northern Rhodesia—					
Metal.....			5,376		
Canada (b)—					
Metal.....	12,880	19,712	6,496	2,128	14,000
India.....	112		(a)	48	82
Australia—					
Ore, etc.....	34,160	25,760	18,480	15,120	17,024
FOREIGN COUNTRIES					
Czechoslovakia—					
Ore.....	294,672		(a)		
Germany (Saxony)—					
Bismuth—Cobalt-Nickel ore.....	11,200	(a)	(a)	(a)	(a)
Rumania—					
Metal.....		112			
Spain—					
Ore.....	275,520	319,536	(a)	211,680	(a)
Metal.....	90,720	82,208	(a)	46,592	(a)
Argentina—					
Ore.....	24,864	(a)	(a)		
Bolivia (c)—					
Ore and concentrates.....	879,760	1,195,712	826,448	239,232	300,048
Japan—					
Metal.....	65,296	60,368	(a)	49,728	70,896

(a) Information not available.

(b) From silver-cobalt ores.

(c) Exports.

CADMIUM

Cadmium was produced for the first time in 1928 at the Trail refinery of the Consolidated Mining and Smelting Company, Limited, as a by-product of the silver-lead-zinc ores treated there. The output of this metal during the year was valued at \$341,374.

"The Mineral Industry 1928" gives the following uses for cadmium.

There are four uses recently developed which account for the rapidly increasing demand for cadmium. It is being used in increasing amounts in making cadmium solders. The Udylyte process is a rust-proofing process, in which iron articles such as locks, small hardware, and automobile parts are electroplated with the metal, after which the work is heated in an oven for several hours at a temperature of from 150-200°C. The Cadalyte process, which is an electroplating process giving a bright silver-like finish, is being extensively used. Cadmium plating is also used in connection with chromium plating, the work being first given a cadmium coat, then followed by the final chromium plate.

Other important uses of the metal or its compounds include: A small amount added to silver alloys makes the silver whiter and more resistant to tarnish. Cadmium has also other uses in jewelry, giving with gold a green alloy. When added to aluminium which is to be used in making powder it improves the colour and luster of the powder and makes it more resistant to corrosion. Cadmium still continues to be extensively used in making fusible alloys. When added in small amounts to copper, the wire drawn from the alloy has greater strength for use in transmission lines without having its conductivity appreciably reduced. It is reported that cadmium is being used in the manufacture of tungsten light filaments. An alloy of cadmium bismuth and mercury is impregnated with tungsten powder, the mixture made into wire by the extrusion process, heated to drive off the alloy, and then finished by heating in a vacuum to consolidate the tungsten. It has been used in the form of wire for spraying-rods for use in metal spray processes, plaster casts and other objects being thus coated with a thin layer of the metal. Storage battery plates of cadmium are being recommended. Such batteries do not deteriorate when standing discharged.

For many years cadmium sulphide, a brilliant yellow pigment has been extensively used for painting street cars, passenger coaches and other materials where freedom from attack of sulphurous gases was desired; the quantity thus used sometimes exceeding that used as metal. Cadmopone, or cadmium lithopone is much cheaper, and for many purposes it is just as satisfactory. It is a mixture of cadmium sulphide and barium sulphate, being similar to lithopone except that the yellow cadmium sulphide replaces the white zinc sulphide. The oxide, hydroxide, and sulphate are used for the electrolytes in the various cadmium-plating processes. Other cadmium compounds such as the chloride, iodide, bromide, and nitrate find various uses in the chemical industries.

Sources.—Practically all the world's production comes from the treatment of the impure zinc solutions used for preparing electrolytic zinc, so that the potential output of cadmium bears a very direct relation to the amount of electrolytic zinc produced. Some cadmium is produced from smelter fluedusts, and a certain amount from the purification of zinc solutions used for making lithopone.

Table 174b.—World Production of Cadmium, 1924-1928

(From *The Mineral Industry*)
(Pounds)

	1924	1925	1926	1927	1928
BRITISH EMPIRE					
Canada.....					491,894
Australia.....	356,898	400,661	358,912	346,773	385,616
FOREIGN COUNTRIES					
Belgium (exports).....			661	7,055	11,464
France.....			20,000	(b) 60,480	(a)
Germany (estimated).....	2,528		100,000	100,000	100,000
Poland.....	41,221	7,835	11,574	13,558	9,283
United States—					
Metal.....	129,328	502,824	810,428	1,074,654	1,875,896
Compounds (metal content).....	(a)	(a)	166,600	229,000	239,920
Mexico.....				200,122	779,433

(a) Information not available.

(b) Estimated. °

CHROMITE

There has been no production of chromite in Canada since 1923 when 3,558 tons valued at \$52,650 were produced.

The mineral chromite (FeO , Cr_2O_3) is the commercial source of the metal chromium, which is of prime importance in the manufacture of chrome steel armour plate and other similar steels. Chromium is a necessary constituent of many high-speed cutting tools, and, in the manufacture of stainless steels, where it makes up from 12 to 14 per cent of the alloy, its use is well established.

Quebec has been the main source of chromite ore in Canada. Rhodesia, India, and New Caledonia, supply over 90 per cent of the world's chromite.

During the war when the higher grades of ore from other continents were not easily obtainable, many low-grade deposits in Canada and the United States were opened up, and for a time considerable metallurgical research was done in Canada on the reduction of chromium-bearing ores. Chromium metal may be obtained from chromium oxide by reduction with aluminium. The metal made in this manner is very pure and free from carbon. In less pure form, it has been made in the electric furnace directly from the ore. The resultant product made in this manner contains small percentages of iron and carbon but not enough to cause any serious trouble when the metal is used in alloys with other metals. Ferrochrome, also a product of the electric furnace, is made from a good grade of chromite ore, and the iron chromite alloy runs about 60

to 70 per cent chromium. This alloy can then be added in the required amounts to a bath of molten steel. Ferrochrome requirements take about 40 per cent of the world's supply of chromite; about 35 per cent of the chromite produced is used in the manufacture of chromite refractories such as brick and other furnace linings, and 25 per cent is used in the manufacture of chemicals.

Considerable research on the plating of chromium has resulted in much success. Because it does not tarnish readily and as chromium plate has a brilliant blue-white lustre, the use of chromium as a plating material has been greatly extended in recent years.

Table 175.—Production of Chromite in Canada, 1886-1928

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1886.....	60	945	1909.....	2,470	26,604
1887.....	38	570	1910.....	299	3,734
1888-93.....					
1894.....	1,000	20,000	1911.....	157	2,587
1895.....	3,177	41,300	1912-13.....		
			1914.....	136	1,210
1896.....	2,342	27,004	1915.....	12,341	179,543
1897.....	2,637	32,474			
1898.....	2,021	24,252	1916.....	(a) 27,517	311,460
1899.....	2,010	21,842	1917.....	(a) 36,725	499,682
1900.....	2,335	27,000	1918.....	21,994	867,122
			1919.....	8,541	228,898
1901.....	1,274	16,744	1920.....	11,016	251,379
1902.....	900	13,000			
1903.....	3,509	51,129	1921.....	2,798	55,696
1904.....	6,074	67,146	1922.....	767	11,503
1905.....	8,575	93,301	1923.....	3,558	52,650
			1924.....		
1906.....	9,035	91,859	1925.....		
1907.....	7,196	72,901			
1908.....	7,225	82,008	1926.....		
			1927.....		
			1928.....		
			Total	187,727	3,175,543

(a) A portion of this ore was sold to a customs mill in the district and the final shipments of ores and concentrates in 1916 were 15,249 short tons valued at \$310,902 or an average of \$20.39 per ton; and 23,713 tons valued at \$581,796 or an average of \$24.54 per ton in 1917.

Table 176.—Production in Canada, and Imports of Chromite, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....						
IMPORTS—						
Bichromate of soda.....	892	109,514	1,030	121,209	1,045	122,378
Bichromate of potash.....	72	10,764	96	15,127	97	17,155
Brick, fire, chrome.....		50,203		52,565		56,375

Table 177.—World Production of Chrome Ore, 1913 and 1924-1928

(From *The Mineral Industry* 1928)
(Metric tons)

Country	1913	1924	1925	1926	1927	1928
Australia.....		785	978	607		
Brazil (a).....				1,500	1,820	20
Canada.....						
Cuba.....		(c) 19,881	(b) 30,309	(c) 36,598	(b) 17,256	29,117
Cyprus (a).....		2,856	2,021	524	711	
Great Britain.....		1,060	455		384	
Greece.....	6,342	14,651	8,079	20,049	15,051	20,958
Guatemala (b).....				54		
India, British.....	5,670	46,192	38,053	33,918	58,125	46,196
Indo-China.....		20				
Japan.....		5,362	5,823	7,052	(d)	9,810
Jugoslavia.....	305	300	12,160	15,983	8,757	16,085
New Caledonia (a).....	63,370	23,021	34,732	34,267	42,885	56,712
Norway (a).....		177	440	17		
Rhodesia, Southern.....	63,384	156,692	123,220	164,376	197,782	199,111
Rumania.....						
Russia.....		11,894	30,111	30,362	18,060	21,972
Turkey (Asia Minor).....	26,374	(d) 6,809	6,809	4,418	16,609	11,852
Union of South Africa.....		4,572	13,756	12,042	16,959	31,764
United States.....	259	293	110	143	204	671
Total.....	165,704	287,756	307,056	361,910	(d)	437,009

(a) Exports.

(b) Imports into the United States.

(c) Production of the Caledonia mine.

(d) Data not available.

IRON ORE

Iron ore was first discovered in Canada in the St. Maurice valley, Quebec, as early as 1667, or perhaps before that. Count Frontenac mined some ore there five years later and the samples, tested in France, were found to be of workable quality.

In 1730 M. Franchville was granted a licence by Louis XIV of France together with a subsidy of 10,000 "livres" to work the St. Maurice iron mines. The project contemplated the construction of a blast furnace which apparently was not successful for, in 1735, he surrendered his rights to the government. Some years later another licence and a subsidy were given La Compagnie des Forges which made not only the iron kettles that were needed by the pioneers for making sugar and soap but furnished the French government with cannon for military enterprises. In 1743 the plant again reverted to the government and was operated by the government until the country passed into the hands of the British.

Nova Scotia with its large iron and steel industry is not at present a producer of iron ore. Deposits of iron ore of various kinds are numerous throughout a large part of the province, which ranks next to Ontario in the matter of total production, but the large deposits of high-grade iron ore in Newfoundland owned and operated by the British Empire Steel Corporation, are much more readily accessible and of a higher and more constant grade than the deposits in Nova Scotia and for that reason the local deposits are not now being worked.

In the early days iron ore mining and smelting were carried on to a small extent in New Brunswick but the ore was low-grade and the operations did not prosper for long.

Iron ore was first mined and smelted in the province of Quebec early in the eighteenth century, and from that time until 1883 the industry was carried on almost continuously at Three Rivers in the St. Maurice district. Other furnaces using local ore were operated at Radnor Forges and at Drummondville, the last to shut down being the Drummondville furnace in 1911. The ores used were bog ores, with charcoal for fuel. The output of all the furnaces was small and the industry derived its chief importance from the superior quality of the pig iron made.

Furnaces have also been built at various times and places in attempts to smelt some of the other classes of ore found in the province, but all were short lived, and none of them achieved commercial success.

More iron ore has been produced in Ontario than in any other province to date but at the present time no properties are producing. About 1896 a system of bounties, inaugurated by the Federal and Provincial Governments to encourage the manufacture of iron and steel from

native ores, had the desired effect of stimulating the industry and the following year, blast furnaces were erected at various points in the province. Strenuous efforts were made to use Ontario ores as far as possible and thus obtain advantages of the bounties offered.

As a result, iron mining and prospecting for iron ore were stimulated but the grade found was generally low and contained deleterious material to such an extent that it was soon found unprofitable to operate.

In northwestern Ontario about 1899, a deposit of hematite that later developed into the Helen mine, was found and this mine was the main source of Ontario's output for a number of years. It is now worked out and closed down. Ontario has a large supply of low-grade iron ore, but beneficiation processes must be applied to make these ores suitable for commercial use.

Production of iron ore in British Columbia has been almost negligible up to the present time, but the small production has not been caused so much by the lack of ore as by the lack of a market for the ore. Different varieties of iron ore are found in various parts of the province, the most important of which are the magnetite deposits which occur on the islands along the coast. In some deposits the sulphur content is high, which would necessitate a preliminary roasting before charging to the blast furnaces, but the ores are easily mined, are close to tide-water and would supply for some years a small iron-smelting industry if the local demand for the products would justify its establishment.

Table 178.—Shipments of Iron Ore from Canadian Mines, by Provinces, 1886-1928

(Short tons)

Year	Nova Scotia	New Brunswick	Quebec	Ontario	British Columbia	Canada
1886.....	44,388			16,032	3,941	64,361
1887.....	43,532		13,404	16,598	2,796	76,330
1888.....	42,611		10,710	16,894	8,372	78,587
1889.....	54,161		14,533		15,487	84,181
1890.....	49,206		22,305	5,000		76,511
1891.....	53,649		14,380		950	68,979
1892.....	78,258		22,690		2,300	103,248
1893.....	102,201		22,076		1,325	125,602
1894.....	89,379		19,492		1,120	109,991
1895.....	83,792		17,783		1,222	102,797
1896.....	58,810		17,630	15,270	196	91,906
1897.....	23,400		22,436	2,770	2,099	50,705
1898.....	19,079		17,873	21,111	280	58,343
1899.....	28,000		19,420	25,126	2,071	74,617
1900.....	18,940		19,000	82,950	1,110	122,000
1901.....	18,619		15,489	272,538	7,000	313,646
1902.....	16,172		18,524	359,288	10,019	404,003
1903.....	40,335		12,035	209,634	2,280	264,294
1904.....	61,293		16,152	141,601		219,046
1905.....	84,952		12,681	193,464		291,097
1906.....	97,820		9,933	141,078		248,831
1907.....	89,839		12,748	207,769	2,500	312,856
1908.....	11,802		10,103	216,177		238,082
1909.....			4,150	263,893		268,043
1910.....	18,134	5,336	4,503	231,445		259,418
1911.....	22	31,120	3,616	175,586		210,344
1912.....	30,857	71,520	1,185	112,321		215,883
1913.....	20,436	86,416	5,102	195,680		307,634
1914.....		4,775		240,079		244,854
1915.....		3,683		394,429		398,112
1916.....			3,209	271,967		275,176
1917.....			17,150	198,152		215,302
1918.....	130		8,159	201,119	2,200	211,608
1919.....			321	195,649	1,200	197,170
1920.....			960	126,912	1,200	129,072
1921.....				58,499	1,010	59,509
1922.....			526	16,190	1,255	17,971
1923.....			69	30,447	243	30,759
1924.....			1,408	44	28	1,480
1925.....			3,978			3,978
1926.....			200			200
1927.....			2,099			2,029
1928.....			2,244			2,244
Total.....	1,279,817	202,859	420,206	4,655,712	72,214	6,630,759

Table 179.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1895-1928

Year	To Nova Scotia	To United States	To Great Britain and Europe	Total shipments
	Short tons	Short tons	Short tons	Short tons
1895.....	2,686	.....	.....	2,686
1896.....	17,410	22,798	.....	40,208
1897.....	12,143	33,039	5,651	50,833
1898.....	34,622	.....	78,640	113,262
1899.....	26,311	98,485	214,322	339,118
1900.....	195,507	153,867	14,776	364,150
1901.....	457,064	84,292	279,102	820,458
1902.....	376,322	96,762	341,421	814,445
1903.....	273,283	90,711	287,793	651,787
1904.....	342,710	6,025	298,694	647,429
1905.....	506,819	6,490	255,846	769,155
1906.....	628,152	141,854	213,867	983,873
1907.....	672,561	123,972	167,074	963,607
1908.....	713,772	59,532	200,033	973,337
1909.....	697,068	241,207	171,722	1,109,997
1910.....	808,762	247,336	203,528	1,259,626
1911.....	737,261	207,193	237,009	1,181,463
1912.....	956,458	191,779	183,673	1,331,910
1913.....	1,048,433	229,402	328,086	1,605,921
1914.....	417,409	43,513	172,998	633,920
1915.....	802,128	.....	66,323	868,451
1916.....	1,012,060	.....	.....	1,012,060
1917.....	883,346	.....	.....	883,346
1918.....	848,574	.....	.....	848,574
1919.....	499,972	.....	.....	499,972
1920.....	624,596	.....	36,708	661,304
1921.....	178,519	.....	206,010	384,529
1922.....	211,482	.....	811,845	1,023,327
1923.....	451,483	.....	356,753	808,236
1924.....	174,602	.....	919,968	1,094,570
1925.....	384,795	.....	883,056	1,267,851
1926.....	465,961	.....	503,640	969,601
1927.....	480,757	68,354	946,569	1,495,680
1928.....	690,316	41,493	1,001,833	1,733,642
Total.....	16,733,341	2,188,044	9,386,940	28,308,328

1929 763,145 89,501 859,970 1,699,049
 1930 913,718 50,636 760,726 1,724,991

Table 180.—Imports into Canada, and Exports of Iron Ore, 1927 and 1928

	1927		1928	
	Quantity	Value	Quantity	Value
	Short tons	\$	Short tons	\$
IMPORTS—				
Iron ore from United States.....	1,006,355	2,212,896	1,563,984	3,419,168
Iron ore from Newfoundland.....	427,682	427,720	584,096	584,118
Iron ore from Sweden.....	32,470	146,159	55,633	247,985
Iron ore from other countries.....	20,859	88,849	19,184	73,888
Total.....	1,487,366	2,875,624	2,222,897	4,325,159
EXPORTS—Total.....	2,475	12,125	2,615	12,500

PIG IRON AND FERRO-ALLOYS, STEEL AND ROLLED PRODUCTS

Statistics of pig iron, steel and rolled products, are regarded as belonging to "Manufactures" rather than to "Mining" but the close relation between the mining of iron ore and the production of pig iron and steel justifies the inclusion here of references to these secondary industries. The data given in this section have been taken from the Bureau's annual bulletin on *The Primary Iron and Steel Industry in Canada, 1928*.

Sales from the primary iron and steel industry (including production of pig iron, ferro-alloys, steel ingots and direct steel castings) in Canada during 1928 amounted to \$62,071,674, an increase of 36 per cent over the \$45,571,264 reported in the previous year which in turn was 11 per cent over the \$41,183,565 recorded for 1926.

Of the 40 firms engaged principally in this line of production, 16 were located in Ontario 10 in Quebec, 6 in Nova Scotia, 4 in Manitoba, 3 in British Columbia, and 1 in Saskatchewan. These concerns reported fixed and working capital at \$114,292,363; employed a monthly average of 9,057 people and paid \$15,470,836 in salaries and wages. Manufacturing processes added \$34,907,211 to the value of purchased materials which cost \$27,164,463. An analysis of the sales values by provinces showed the following distribution: Ontario, \$36,926,646; Nova Scotia, \$15,625,206; Quebec, \$7,350,581; Manitoba, \$1,959,241; and Alberta and British Columbia, \$210,000.

(a) *Pig Iron*.—Blast furnace production of 1,037,727 long tons of pig iron showed a gain of 46 per cent over the 1927 output of 709,697 tons. About 70 per cent of the output, or 706,700 tons, was shipped to the makers' own plants, 258,479 tons were sold and the remainder, not otherwise accounted for, 72,548 tons, was probably in stock at the end of the year. Production for the year included 724,559 tons of basic iron, 233,386 tons of foundry iron and 79,782 tons of malleable iron.

Based on an estimated population in Canada of 9,658,000 persons in 1928, the per capita production of pig iron amounted to 241 pounds as against 167 pounds in the previous year, 178 pounds in 1926 and an average of 136 pounds in 1925.

Ontario produced 71 per cent of the Canadian output in 1928 as against 65 per cent in the previous year. Nova Scotia accounted for the remainder in each year.

Four firms in Canada produced pig iron during 1928, namely: The British Empire Steel Corporation, Sydney, N.S.; The Steel Company of Canada, Limited, Hamilton, Ont.; The Algoma Steel Corporation, Limited, Sault Ste. Marie, Ont.; and The Canadian Furnace Company, Limited, Port Colborne, Ont.

Employees in blast furnace departments numbered 959 in 1928.

Production of ferro-alloys in Canada during 1928 totalled 44,482 long tons as compared with 56,230 tons for last year. The following firms manufactured during 1928: Electro Metallurgical Company of Canada, Ltd., Welland, Ont. (including the Union Carbide Co. of Canada); Canadian Carborundum Co., Ltd., Niagara Falls, Ont.; The Abrasive Company of Canada, Ltd., Hamilton, Ont.; and the Exolon Co., Thorold, Ont. Only the first mentioned company has been included in the iron and steel group, the others being essentially manufacturers of abrasives.

(b) *Steel Ingots and Castings*.—Production of steel ingots and castings in 1928 was 1,234,719 tons, an increase of 36 per cent over the total of 907,945 tons for 1927. The year's figures included 1,190,001 tons of steel ingots and 44,718 tons of steel castings; practically all the ingots were intended for the further use of the makers while most of the castings were made for sale.

Per capita production in Canada of steel ingots and castings amounted to 288 pounds during the year under review, as compared with 213 pounds in 1927, an average of 185 pounds in 1926, and 180 pounds in 1925.

During the year 23 plants had furnaces for making steel ingots and direct steel casting. Quebec had 7 plants; Ontario, 7; Manitoba, 3; British Columbia, 3; Nova Scotia, 2; and Alberta, 1. Employees in these plants numbered 3,079 in 1928.

(c) *Rolled Products*.—Rolling mill sales were valued at \$46,565,831 in 1928 as compared with \$31,354,665 in 1927. During the year 1,445,081 long tons of iron and steel passed through the rolling mills and of this total 1,306,179 tons came from the producers' own plants and 138,904 tons were purchased.

The 12 rolling mills operated during 1928 were located as follows: Ontario, 5; Quebec, 3; Nova Scotia, 3; Manitoba, 1. The average number of employees in these plants in 1928 was 5,019.

Rolling mill products in 1928 included 1,058,321 tons of blooms, billets and slabs; 358,375 tons of bars, 349,189 tons of rails, 160,446 tons of rods, 70,613 tons of railway tie plates, 54,193 tons of plates and sheets, 35,659 tons of structural steel shapes, 17,549 tons of railway fish plates, 350,598 kegs of railway spikes, and many articles such as axles for railway cars and locomotives, railway track equipment, horseshoes, washers, bolts, nuts, rivets, etc. There are, of course, some duplications in the tonnages given above; for example, most of the blooms and billets are rolled into bars, rods, etc.

Table 180a.—Principal Statistics of the Primary Iron and Steel Industry in Canada, 1924-1928

Year	Number of plants	Capital employed	Average number of employees	Salaries and wages	(x) Cost of materials at works	(x) Selling value of products at works	Value added by manufacturing
		\$		\$	\$	\$	\$
1924.....	29	79,805,201	5,325	7,201,588	19,410,742	33,553,443	14,142,701
1925.....	32	82,593,940	5,101	7,291,172	16,433,911	35,337,685	18,903,774
1926.....	33	86,987,454	6,140	9,054,170	19,912,723	41,183,565	21,270,842
1927.....	36	96,295,734	7,396	11,809,198	18,993,940	45,571,264	26,577,324
1928.....	40	114,292,363	9,057	15,470,836	27,164,463	62,071,674	34,907,211

(x) Figures of materials used are of purchased materials only, and production figures cover sales only.

Table 181.—Principal Statistics of the Pig Iron and Ferro-Alloys, Steel and Rolled Products Industry in Canada, by Provinces, 1927 and 1928

Province	Year	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of materials	Production	Value added by manufacturing
			\$		\$	\$	\$	\$
Nova Scotia.....	1927	5	25,107,583	1,240	1,707,614	4,328,896	9,870,155	5,541,259
	1928	6	29,978,715	2,121	3,263,144	7,067,650	15,625,206	8,557,556
Quebec.....	1927	10	10,056,862	1,660	2,143,270	1,392,396	6,433,538	5,041,142
	1928	10	10,282,082	1,737	2,433,334	1,652,038	7,350,581	5,698,543
Ontario.....	1927	15	59,352,279	4,101	7,474,972	12,884,127	27,769,202	14,885,075
	1928	16	72,098,748	4,709	9,092,742	17,859,303	36,926,646	19,067,343
Canada*.....	1927	36	96,295,734	7,396	11,809,198	18,993,940	45,571,264	26,577,324
	1928	40	114,292,363	9,057	15,470,836	27,164,463	62,071,674	34,907,211

*Includes data for 4 plants in Manitoba and 2 in British Columbia for 1927, and for 4 in Manitoba, 3 in British Columbia and 1 in Alberta for 1928.

Table 182.—Materials Charged to Iron Blast Furnaces in Canada, 1928

Item	Quantity	Cost at furnace
		\$
Imported iron ore..... long tons	1,801,687	6,386,498
Mill cinder, scale, slags, etc..... long tons	127,353	245,542
Scrap..... long tons	55,538	577,504
Limestone..... short tons	566,170	781,781
Coke, from Canadian coal..... short tons	384,830	1,784,506
Coke, from imported coal..... short tons	665,675	3,616,323
Coke, imported..... short tons	71,259	480,138
Other materials.....		9,640
Total.....		13,881,932

Table 183.—Production of Pig Iron in Canada, by Grades, 1928

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Pig Iron—				
Basic.....	724,559	695,490	21,736	403,537
Foundry.....	273,386	8,036	185,788	3,677,754
Malleable.....	79,782	3,174	50,955	1,003,830
Total.....	1,077,727	706,700	258,479	5,085,091

Table 184.—Production of Ferro-Alloys in Canada, 1920-1928.

	Long tons		Long tons
1920.....	27,781	1924.....	35,034
1921.....	22,608	1925.....	25,709
1922.....	21,602	1926.....	57,050
1923.....	41,887	1927.....	56,230
		1928.....	44,482

Table 185.—Materials Used in the Steel Ingots and Castings Industry in Canada, 1928

Item	Unit of measure	Companies' own production	Purchased materials	
			Quantity	Cost at furnace
				\$
(a) Metals:—				
Pig iron.....	Long ton	692,185	6,607	166,756
Spiegeleisen and ferromanganese.....	Long ton		9,834	680,276
Ferrosilicon.....	Long ton		4,921	306,797
Other ferro-alloys.....	Long ton		565	184,533
Metals for making alloy steels (nickel, etc.).....	Long ton			70,886
Scrap iron or steel, including old rails not intended for re-rolling.....	Long ton	64,208	364,028	4,793,502
Scrap made and consumed in works reporting.....	Long ton	202,581		
Total metals.....				6,202,750
(b) Ores:—				
Crude iron ore:—				
Foreign.....	Long ton		78,000	493,237
Manganiferous ore:—				
Foreign.....	Long ton		2,966	57,173
Chrome, etc.:—				
Foreign.....	Long ton		663	21,006
Total ores.....				571,416
(c) General materials:—				
Limestone.....	Short ton		148,545	229,735
Fluorspar.....	Short ton		9,201	124,768
Other fluxing material.....	Short ton		41,876	227,243
Coke from Canadian coal.....	Short ton		1,700	23,502
Coke made in Canada from imported coal.....	Short ton		1,117	9,016
Imported coke.....	Short ton		260	3,584
Anthracite coal.....	Short ton		1,756	12,638
Bituminous coal.....	Short ton		2,150	12,300
Charcoal.....	Bushel		80,886	19,665
Carbon electrodes.....				87,635
Other materials.....				404,574
Total general materials.....				1,154,660
Total value of all metals, ores and general materials purchased.....				7,928,826

Table 186.—(x) Products of the Steel Ingots and Castings Industry in Canada, 1928

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
			Long tons	\$
Steel Ingots:—				
Basic open hearth.....	1,189,399	1,183,799		
Electric or electrically refined.....	602		602	59,948
Direct Steel Castings:—				
Basic.....	20,109	7,017	13,445	2,394,750
Bessemer.....	2,019	88	1,931	432,355
Electric or electrically refined.....	22,590	29	22,466	4,135,643
Total.....	1,234,719	1,190,933	38,444	7,022,696

(x) Production figures as given herein do not necessarily represent the total Canadian output; there may be also a small production in other industrial groups.

Table 187.—Materials Used in the Rolled Iron and Steel Products Industry in Canada, 1928

Item	Companies' own make	Purchased materials	
		Quantity	Cost at furnace
	Long tons	Long tons	\$
Steel, crude and semi-finished (ingots, blooms, billets, slabs).....	1,296,372	76,580	2,556,194
Rails for re-rolling.....		52,339	897,842
Iron muck and scrap bar.....	926	1,124	37,132
Iron and steel wire rods.....		643	32,914
Iron and steel scrap.....	8,881	3,299	40,849
Axles, scrap.....		4,919	107,451
All other materials.....			85,017
Total.....			3,757,429

Table 188.—(x) Products of the Rolled Iron and Steel Products Industry in Canada, 1928

Item	Total tonnage made	Tonnage shipped to companies' own plant	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Blooms, billets and slabs.....	1,058,321	874,394	80,461	2,581,638
Bars of all kinds.....	358,375	111,877	254,149	13,271,778
Rails, open hearth steel.....	394,189	237	349,007	16,109,847
Rods, iron or steel, wire, spike and chain.....	160,446	113,451	45,032	1,765,168
Structural steel, including angles, beams, channels, girders, etc., not assembled or fabricated.....	35,659	588	32,005	1,483,768
Plates and sheets.....	54,193	15,683	38,011	2,878,364
Railway tie plates.....	70,613	4	71,523	3,910,522
Railway fish plates.....	17,549		15,179	957,447
Railway spikes.....	Lb. 350,598		350,598	1,258,906
Washers.....	Kegs 1,857,574		1,426,068	100,727
All other products.....				22,920
(*) Products of 1 or 2 firms.....				2,224,746
Total.....				46,565,831

(x) Production figures given in table 188 do not necessarily represent the total Canadian output of the commodities listed; there may also be a small production in other industrial groups.

(*) Includes chains, horse and mule shoes, etc.

Table 189.—World Production of Pig Iron, Steel Ingots and Castings, 1913, 1927 and 1928.

(In 1,000's of long tons = 2,240 lb. as reported by the Iron Trade Review.)

Country	Pig iron			Steel ingots and castings		
	1913	1927	1928	1913	1927	1928
United States.....	30,653	36,289	37,400	31,301	44,935	51,400
Canada.....	1,015	760	1,030	1,043	907	1,230
Great Britain.....	10,260	7,294	6,630	7,664	9,099	8,495
France.....	5,126	9,150	9,890	4,614	8,100	9,170
Belgium.....	2,445	3,692	3,815	2,428	3,645	3,865
Luxemburg.....		2,680	2,725		2,431	2,530
Italy.....	420	487	495	919	1,569	1,950
Spain.....	418	584	610	238	660	690
Sweden.....	732	448	385	582	491	525
Germany.....	19,000	12,893	11,500	18,632	16,050	14,000
Saar Territory.....		1,743	1,900		1,865	2,050
Austria.....	2,344	428	450	2,585	551	630
Czechoslovakia.....		1,241	1,515		1,845	1,800
Poland.....		607	660		1,226	1,350
Hungary.....		294	275		464	470
Russia.....	4,563	2,985	3,290	4,181	3,662	4,150
Japan.....	236	1,225	1,375	300	1,635	1,680
China.....	150	300	300	100	30	30
India.....	204	1,145	1,010		575	445
Australia.....	47	550	425		448	500
Miscellaneous.....	200	400	450	100	220	250
Total.....	77,813	85,195	86,130	74,687	100,408	107,210

1913 figures for Germany include Luxemburg and the Saar; 1913 figures for Austria include the major portions of Czechoslovakia and Hungary; Poland's production is covered in the figures for Germany and Russia in 1913 and for 1927 and 1928 Poland's figures include most of Upper Silesia. Japan's figures include Manchuria and Chosen.

MANGANESE

No manganese has been produced in Canada since 1924 when 584 tons of ore valued at \$4,088 were produced in the province of New Brunswick. Deposits of manganese are also known to occur in Lunenburg county, Nova Scotia, and in British Columbia near the town of Kaslo.

The importance of manganese in the manufacture of iron and steel is steadily increasing. A large part of the consumption is in the manufacture of manganese-iron alloys (spiegeleisen and ferromanganese) for the manufacture of certain steels.

The greatest deposits and the chief sources of manganese up to the present time are in Russia (Caucasus), Southern and Central India and East Central Brazil. It also occurs in commercial quantities in several countries of Europe, Canada, the United States, Mexico, and in Queensland, Australia.

Table 190—Production of Manganese Ore in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886	1,789	41,499	1900	30	1,800	1913		
1887	1,245	43,658				1914	28	1,120
1888	1,801	47,944	1901	440	4,820	1915	201	9,360
1889	1,455	32,737	1902*	172	4,062			
1890	1,328	32,550	1903	91	2,775	1916	957	89,544
			1904	66	2,740	1917	158	14,836
1891	255	6,694	1905*	22	1,720	1918	440	6,230
1892	115	10,250				1919	661	14,159
1893	213	14,578	1906*	93	925	1920	649	11,029
1894	74	4,180	1907*	1	22			
1895	125	8,464	1908			1921	68	3,400
			1909			1922	73	2,044
1896*	124	3,975	1910			1923	200	1,400
1897*	15	1,166				1924	584	4,088
1898	50	1,600	1911	6	300	1925-28		
1899	1,581	20,004	1912	75	1,875			
						Total	15,185	447,548

*Exports.

Table 191—World Production of High-Grade Manganese Ore 1913 and 1924-1928

(From The Mineral Industry 1928)
(Metric tons)

Country	1913	1924	1925	1926	1927	1928
Austria	16,540		(a)	(a)	(a)	(a)
Australia (d)	27	4,838	1,183	1,414	1,513	(a)
Brazil	122,300	159,229	331,826	260,536	273,494	269,180
Canada		530				
China		38,538	43,260	42,460	46,850	(a)
Cuba	11,589 (e)	25,310	51,638	28,091	129,832	(a)
Czechoslovakia	(b) 4,697	79,133	54,054	78,027	95,231	108,441
Dutch East Indies	(a)	150,194	80,567	121,868	152,845	(a)
Egypt	(a)	8,482	10,997	11,393	18,500	(a)
France	7,732	5,000	4,002	2,625	2,710	3,108
Germany	748	3,554	144	25	30	(a)
Gold Coast		259,441	363,118	405,194	409,906	(a)
Greece	556	5,726	4,303	6,348	5,726	(a)
Hungary	13,004	1,217				
India	828,088	815,894	852,934	1,031,838	1,147,479	(a)
Italy	1,622	12,189	14,984	14,010	9,764	9,500
Japan	18,039	7,585	12,040	15,209	27,567	(a)
Morocco	(a)	(a)	679	1,550	2,056	(a)
Porto Rico (f)		4,698	4,260	1,440	1,650	(a)
Rumania	(a)	6,482	5,368	8,353	10,369	(a)
Russia and Georgia	1,254,658	500,693	619,100	969,800	839,800	710,300
Spain	21,594	20,840	36,072	44,947	36,870	12,836
Sweden	4,001	10,885	10,941	15,258	16,823	15,790
Tunis and Algeria		3,626	2,105	2,127	5,873	4,025
United Kingdom	5,480	2,496	842	130	1,534	(a)
United States	4,113	57,422	99,912	47,000	45,459	47,385
Total for World (c)	2,321,000	2,251,000	2,604,000	3,110,000	3,282,000	

(a) Statistics not available.

(b) Bosnia-Herzegovina.

(c) Total of known production.

(d) Includes New Zealand.

(e) Exports.

(f) Exports received in United States.

MERCURY

During 1926 a small amount of mercury was recovered from a property on the north shore of Kamloops lake, B.C. In 1895, 1896 and 1897 a small production was derived from the same district.

Cinnabar, the principal ore of mercury is found in many countries of the world but the chief producing countries are Italy, Spain and United States in order of their importance. Mercury is used in the amalgamation of gold and silver and as a fulminate in the making of detonators. It also enters largely into the manufacture of drugs, and vermilion (mercuric sulphide) the well-known red pigment. Its increased use in the United States is due to the greater consumption in electrical apparatus such as radios, meters, and storage batteries.

Table 192.—Production of Mercury in Canada, 1895-1928

Year	Flasks	Price per flask	Value
		\$	\$
1895.....	71	33.00	2,343
1896.....	58	33.44	1,940
1897.....	9	36.00	324
1898-1928.....			

Table 193—Imports into Canada of Mercury, 1924-1928

Year	Pounds	Value
		\$
1924.....	85,459	60,675
1925.....	146,435	118,697
1926.....	100,492	84,910
1927.....	124,099	160,330
1928.....	199,603	269,746

Table 194.—Monthly Average Price of Mercury, 1926-1928

(At New York, per flask of 76 pounds)*

Month	1926	1927	1928
	\$	\$	\$
January.....	87.960	101.200	123.620
February.....	87.580	101.727	121.370
March.....	88.194	110.259	122.557
April.....	89.769	123.250	123.740
May.....	91.365	123.900	123.173
June.....	91.346	118.093	122.423
July.....	90.163	119.880	121.260
August.....	89.260	119.111	124.500
September.....	91.425	119.640	123.000
October.....	97.260	126.200	128.923
November.....	99.000	127.708	123.000
December.....	99.510	126.933	122.500
Average.....	91.903	118.159	123.506

*Prior to June, 1927, the unit was 75 pound flask.

Table 195.—World Production of Mercury 1913 and 1924-1928

(From *The Mineral Industry*, 1928)
(In metric tons)

Country	1913	1924	1925	1926	1927	1928
Austria.....	819	5	6	7	6	(c)
China (a).....	2	3	3	(c)	(c)	(c)
Czechoslovakia (d).....	89	78	73	82	1,996	(c)
Italy.....	1,004	1,641	1,833	1,810	81	1,790
Mexico.....	166	37	39	45	384	85
Spain.....	1,245	899	1,277	1,594	2,483	(c)
United States.....	670	369	312	230	384	573
Other countries.....	28	70	17	112	(c)	(c)
Total.....	4,023	3,099	3,560	3,992	(b) 5,100	.....

(a) Exports. (b) Estimated. (c) Not yet available. (d) Prior to 1919, Hungary.

MOLYBDENUM

Molybdenite deposits are known to occur in Nova Scotia, Quebec, Ontario, Manitoba and British Columbia, but the principal production has come from the Moss Mine near Quyon in Pontiac county, Quebec.

In 1926 the Moss mine at Quyon, Quebec, produced 25,168 pounds of molybdenum concentrates containing 20,943 pounds of molybdenum sulphide which, at 50 cents per pound, was worth \$10,472. There was no production in 1928, although development work was done on a property in northwestern Quebec.

The war stimulated the demand for molybdenum ores to an appreciable extent but with the cessation of hostilities, the producers were left with considerable stocks on hand for which there was no immediate market, owing to the limited uses of the metal. The ore produced was mostly low-grade material carrying less than 2 per cent MoS_2 , but there was some which ran from 2 to 15 per cent MoS_2 , and some higher grade hand-picked material was also produced.

Molybdenum is chiefly used in the manufacture of molybdenum steel for use in automotive construction. The principal producing countries during the last three years were the United States, Norway, Australia and Canada.

Table 196.—Production of Molybdenite in Canada, 1902-1928

Year	Ores mined	Ores treated	Ores and concentrates shipped		MoS ₂ content of shipments	MoS ₂ production (probable recovery)	
	Tons	Tons	Tons	Value (a) \$	Pounds	Pounds	Value (b) \$
1902.....	3	.....	3.3	400	(c)	(c)	(c)
1903.....	600	.....	85.0	1,275	(c)	(c)	(c)
1904-1913.....	.....	.....	.....	.....	.....	.....	.....
1914.....	166	.....	16.5	2,063	3,814	3,814	2,063
1915.....	2,242	216	39.0	28,920	29,210	29,210	28,450
1916.....	13,522	9,100	610.0	188,316	156,461	156,461	156,461
1917.....	26,871	22,605	1,554.3	320,006	330,316	288,705	288,705
1918.....	34,030	33,935	461.3	428,807	378,482	378,020	434,733
1919.....	7,280	6,783	46.0	69,203	83,002	83,002	69,203
1920-1923.....	.....	.....	.....	.....	.....	.....	.....
1924.....	700	668	10.0	9,370	18,739	18,739	9,307
1925.....	00	2,779	15.3	11,176	22,350	22,350	11,176
1926.....	4,186	4,490	12.6	10,472	20,943	20,943	10,472
1927.....	.....	.....	.....	.....	.....	.....	.....
1928.....	.....	.....	.....	.....	.....	.....	.....

(a) Value as given by the operators. (b) Estimated at the average market value of molybdenite.
(c) No figures available.

Table 197.—World Production of Molybdenum, 1924-1928

(In 1,000 pounds molybdenum content)

(From *The Mineral Industry*, 1928)

Country	1924	1925	1926	1927	1928
Australia, N.S.W.	13	7	1		
Australia, Queensland	2	4		1	
Australia, Victoria	48	39	48		
Canada	11	17	12		
Japan					
Korea				44	
Norway	94	159	154	175	
Spain					
Sweden			7		
United States	297	1,154	1,371	2,150	3,410
All other countries			45	19	
Total	465	1,380	1,682	2,345	3,410

TIN

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important perhaps being the discovery of cassiterite, near New Ross, Lunenburg county, N.S. Reports upon it may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines for 1907, 1908, 1910, 1911 and 1912.

Cassiterite occurs in a few scattered crystals in pegmatite dykes in the drainage basin of McDougal creek, Lardeau division, B.C., and it has been found also in black sands in the Atlin district, B.C., and in the alluvial sands of Dublin gulch, Mayo district, Yukon.

Tin is also found in Sullivan mine ore which is primarily lead and zinc. It has been separated by the Consolidated Mining and Smelting Company, Limited, but up to the present, the work has been only experimental and there has been no commercial production of the metal from this source.

An occurrence of tin has been noted in some bodies of sulphide minerals found in the vicinity of West Hawk and Star Lakes, near the boundary line between Ontario and Manitoba.

Ores of tin were formerly imported from South America and reduced in Canada by the Electro Tin Products Company at Brantford, Ontario. The plant, which consisted of roasting furnaces, electric smelting and slag-cleaning furnaces, was dismantled some years ago when competition of European smelters treating the easily-reducible tin concentrates from the Malay States, made the operation of the Canadian plant (and several in the United States) unprofitable.

Table 198.—Imports into Canada of Tin, 1926-1928

	1926		1927		1928	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Tin in blocks, pigs and bars	5,107,900	3,263,513	4,833,800	3,036,032	5,358,700	2,822,413
Tin foil	304,242	179,265	154,622	77,914	102,388	61,127
Strip waste	498,200	3,139	4,000	66	2,000	40
Collapsible tubes		43,318		82,179		44,655
Dairy tin		80,716		69,279		74,400
Tinware, etc. (a)		685,655		638,405		838,204
Tin cans and containers		666,281		673,173		518,047
Bichloride of tin or tin crystals	223,913	76,081	415,705	147,323	737,818	229,985
Total		4,997,968		4,754,421		4,588,871

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin, n.e.s.

Table 199.—World Production of Tin (a) 1915 and 1924-1928

(From *The Mineral Industry* 1928)

(Long tons)

Country	1915	1924	1925	1926	1927	1928
Australia.....	5,836	3,069	3,016	2,915	2,860	2,870
Bolivia (b).....	21,544	31,553	32,083	30,543	35,812	41,415
China.....	7,995 (d)	6,858 (d)	8,789 (d)	6,477 (d)	6,072	6,813
Congo.....	28 (b)	483 (e)	600 (b)	1,200 (b)	1,200	1,086
Dutch East Indies.....	19,255	31,558	32,749	33,006	33,411	34,943
Federated Malay States (b).....	46,765	44,043	45,925	45,946	52,179	61,935
Great Britain.....	4,968	1,986	2,339	2,327	2,592	2,761
India.....	430	1,375	1,323	2,413	2,361	2,561
Japan.....	336	341	350			
Indo-China and Japan (e).....					700	1,463
Nigeria.....	4,837	6,162	6,186	7,042	7,562	9,044
Portugal and Spain.....	293 (e)	100 (e)	100 (e)	100 (e)	1,500 (e)	1,500
Siam (c).....	8,968	7,793	6,802	6,978 (e)	7,435 (e)	7,572
Unfederated Malay States (b).....	3,040	2,870	2,145	1,842	2,143	2,524
United States.....	91	6	12	7		
Union of South Africa.....	2,056	1,150	1,142	1,275	1,133	1,178
East Africa.....					33	185
South West Africa.....					180 (b)	200
Other countries (e) (f).....	400	1,100	1,200	800		
Total.....	126,872	140,447	144,761	142,871	157,173	178,050

(a) Tin content of ore.

(b) Exports. (c) Fiscal years ending March 31, of succeeding calendar year.

(d) Shipments to Europe, Asia, and the United States. (e) Estimated.

(f) Includes data for French Indo-China, Germany, Swaziland, etc.

TUNGSTEN

Tungsten ores are found in several very widely separated districts in the Dominion, notably, in the provinces of Nova Scotia, New Brunswick, Manitoba and British Columbia. Deposits in Nova Scotia and New Brunswick are the most important. In 1928 some intensive prospecting was done at the Indian Path mine, Lunenburg county, Nova Scotia.

The only important productions ⁽¹⁾ of tungsten ore in Canada reported, are the following:

In 1912 there was a shipment of 14 tons of concentrates produced by the Scheelite Mines, Ltd., of Moose River, N.S.

In 1917 a small test shipment of a few hundred pounds was made from Halifax county, N.S., and another from Dublin gulch, Mayo district, Y.T., amounting in all to 580 pounds, running 69.41 per cent WO_3 and netting \$234.

The production in 1918 amounted to $13\frac{1}{2}$ tons valued at \$11,700 and with a metallic content of 19,915 pounds of WO_3 . This production consisted of 11 tons of concentrates shipped to New York by the Acadia Tungsten Mines, Limited, operating at Burnt Hill, N.B., and a few small consignments to the Mines Branch testing plant, Ottawa, from Nova Scotia, Manitoba, and the Mayo district, Yukon.

China is the world's greatest producer of tungsten and in 1928 the production from that country amounted to about 50 per cent of the world's output of tungsten ores. Practically the entire Chinese output was exported to Germany, the United States, Great Britain, Belgium, France and others. Germany was the largest consumer, her total imports approximating 5,200 short tons, in terms of 60 per cent concentrates or almost half of the world's output for 1928.

(1) Mines Branch report, 1920.

Table 200.—World Production of Tungsten (a) 1917, and 1924-1928

(Metric tons; 60 per cent WO₃ concentrates)

(The Mineral Industry, 1928)

Country	1917	1924	1925	1926	1927	1928
NORTH AMERICA—						
United States.....	5,574	512	1,080	1,254	1,056	1,170
Mexico.....	308	*25	*25	*25	*25	*25
SOUTH AMERICA—						
Argentina.....	1,085	132	4	*11	*10	*50
Bolivia.....	4,215	18	75	109	*79	*100
Peru.....	427		5	18		
EUROPE—						
England.....	255	2	2	20	*35	*35
France.....	261		150	*110	*100	*100
Portugal.....	1,580	305	207	240	*179	*500
Saxony-Bohemia.....	295	*98	221	*140	*50	*50
Spain.....	446	200	73	*148	*197	*50
ASIA—						
Burma.....	4,226	813	850	1,900	1,277	*1,000
China.....	1,361	3,000	7,000	8,000	*5,666	*6,600
Federated Malay States.....	837	105	171	163	24	*30
Unfederated Malay States.....	334	325	251	234	*170	*100
French Indo-China.....	433	150	189	170	*200	*100
Japan and colonies.....	1,682	1.5	15	18	45	
Siam.....	726	10	10	10	8	
AUSTRALASIA—						
New South Wales.....	268	10	7			
New Zealand.....	235	3	2	9	7	
Northern Territory.....	252					
Queensland.....	471	1	5	1	3	27
Tasmania.....	286	60	207	91	*176	178
Total.....	25,557	5,784	10,549	12,671	9,307	10,115

(a) Statistics reported by F. L. Hess and L. M. Jones of the United States Bureau of Mines and by foreign governments.

*Preliminary estimate.

CHAPTER SEVEN

The Non-Ferrous Smelting and Refining Industry in Canada

Co-incident with the expansion in the mining of ores bearing non-ferrous metals, there has been a notable growth in the smelting and refining of such ores in Canada. Abundant water power, advantageously distributed over the Dominion, has made possible the generation of electric energy at such a low price that the use of electrochemical or electrothermic processes has been adopted in many new fields. Among these may be noted the smelting of bauxite ores and the production of aluminium in various forms in Quebec, the refining of nickel and copper in central Ontario, the manufacture of electrolytic lead and zinc in British Columbia. Electric furnaces are also used in the manufacture of abrasives and ferro-alloys, and, in a small way, in the treatment of iron and steel.

As a source of power, electric energy is being used to an increasing extent in the mining and milling fields and important economies in operation are being effected.

In the treatment of ores, the mining and milling operations are so closely associated, that it is impossible to make a separation of the statistics in these two steps. There is less difficulty in drawing a line between mining and milling on the one hand, and smelting and refining on the other. This chapter is devoted to a consideration of the smelting and refining industry in Canada treating the ores of the non-ferrous metals.

The 10 plants operated by the 8 companies included in this group in 1928 were as follows:— 1 plant at Arvida and 1 plant at Shawinigan Falls, Quebec, both operated by the Aluminum Company of Canada, Limited; the smelter at Rouyn, Quebec, operated by the Horne Copper Corporation; the smelter at Coniston, Ontario, operated by the Mond Nickel Company of Canada, Limited; the smelter at Copper Cliff and refinery at Port Colborne, Ontario, operated by the International Nickel Company of Canada, Limited; the smelter and hydrometallurgical works of the Deloro Smelting and Refining Company at Deloro, Ontario; the smelter of the Kingdon Mining, Smelting and Manufacturing Company, Limited, near Galetta, Ontario; the smelter, lead refinery, zinc refinery, precious metals refinery and copper refinery of the Consolidated Mining and Smelting Company at Tadanac, near Trail, B.C.; and the smelter of the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox, B.C.

In Quebec the Aluminum Company of Canada operated their new plant at Arvida steadily throughout the year on the production of aluminium. Smelting of alumina imported from the United States has been carried on at Shawinigan Falls for many years and the construction of the new plant at Arvida by the same company places the province of Quebec in an enviable position as a producer of aluminium metal in its various forms.

In the Horne Copper Corporation, Quebec has another industrial enterprise that has attracted much attention since its formation. Smelter construction, which was commenced early in 1926, was completed and the smelter put in operation on December 16, 1927; treatment of customs ores from the mines of the district are adding to the smelter output.

Ontario has 4 smelters and 1 refinery in operation. The Mond Nickel Company Limited operates a smelter at Coniston, Ontario, producing a matte that is then shipped to the refinery operated by the same company at Clydach, Wales, where nickel metal, copper sulphate, gold, silver, and the metals of the platinum group are produced. The International Nickel Company mines and smelts nickel-copper ore at Copper Cliff, Ontario, producing a nickel-copper matte, part of which is shipped to Huntington, West Virginia, U.S.A., where it is made into the alloy known as monel metal, and the remainder is shipped to the company's refinery at Port Colborne, Ontario, where refined and electrolytic nickel, converter copper and sponge platinum are made.

The Deloro Smelting and Refining Company of Deloro, Ontario, treats ores from the districts of Cobalt, South Lorrain and Gowganda and produces refined silver, cobalt metal, cobalt oxides and salts, nickel metal, nickel oxides and salts, white arsenic, bismuth metal, various insecticides and stellite, an alloy of cobalt, chromium and tungsten used mainly as a metal cutting tool. The Kingdon Mining, Smelting and Manufacturing Company operates a lead mine, mill and small smelter or Scotch hearth at Galetta, Ontario. As the general statistics given by the last named company were not separated by departments and as mining and milling predominate in this enterprise, data on capital investment, salaries, wages, etc., for this property have been combined with the statistics on silver-lead-zinc mining, but the value of the smelter production has been included with the figures for the other smelters. An estimate was made of the value of the ores smelted and this figure was included in the totals for the silver-lead-zinc mining section, so that the proper adjustments have been made to ensure the comprehensive treatment of mine and smelter statistics.

British Columbia is the only other province in the Dominion in which there are non-ferrous smelting plants in operation. In this province there are 2, one operated by the Consolidated Mining and Smelting Company at Trail, and the other by the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox. The smelter at Trail is the largest non-ferrous metallurgical works in the British Empire. There facilities are provided for the treatment of lead ore and concentrates, zinc ore and concentrates, copper and gold ore and concentrates. This smelter purchases practically all the smelting ore mined in southern British Columbia but its main source of supply is from the famous Sullivan zinc-lead mine at Kimberley, B.C., which is owned by the company. The products are, fine gold, fine silver, refined copper, refined lead, refined zinc, cadmium, copper sulphate, and small amounts of platinum and palladium. Each year new demands have been made on the capacity of the smelter, which have been met so readily that very little smelting material within reasonable hauling distance is now sent elsewhere. This company also operates a concentrator to which mining companies that have no mill may send their ore. In the northern part of the province, at Anyox there is the copper smelter of the Granby Consolidated Mining, Smelting and Power Company Limited, which treats the ore from its own mine, the Hidden Creek, and does some custom work as well. The copper matte made at Anyox is shipped to the United States for refining.

Table 201.—Ores, Concentrates and Residues Smelted and Value of Smelter and Refinery Products in the Non-Ferrous Smelting and Refining Industry, 1927 and 1928

	1927	1928
	\$	\$
Materials used—		
Ores, concentrates, residues, etc. (estimated value).....	32,516,687	33,261,225
Products made—		
Gold, silver, blister copper, refined copper, lead, zinc, nickel, nickel-copper matte, nickel oxide, nickel salts, cobalt, cobalt oxide, cobalt salts, speiss residues, aluminium, base bullion, cadmium and bismuth.....	77,996,265	94,341,702

Table 202.—Capital Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Lands, buildings, plants, machinery and tools.....	55,857,236	70,356,321
Materials on hand, supplies, finished products, ore in storage.....	19,209,512	22,461,571
Cash, trading and operating accounts, bills receivable.....	10,299,914	17,214,850
Total.....	85,366,662	120,035,742

Table 203.—Employees, Salaries and Wages in the Non-Ferrous Smelting and Refining Industry in Canada, 1927 and 1928

	1927			1928		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female		Male	Female	
Salaried Employees—			\$			\$
Total.....	584	60	1,551,036	612	73	1,635,580
Wage-Earners—						
January.....	7,461	26	10,569,204	6,188	29	10,593,153
February.....	7,286	26		6,289	29	
March.....	6,894	27		6,652	29	
April.....	6,672	27		6,478	29	
May.....	6,641	27		6,805	29	
June.....	6,848	27		6,981	29	
July.....	6,557	29		6,874	29	
August.....	6,642	27		6,893	30	
September.....	6,755	28		6,917	41	
October.....	6,636	29		6,841	43	
November.....	6,585	29		6,842	41	
December.....	6,709	28		6,801	41	
*Average.....	6,999	28	6,804	37
Total.....	7,583	88	12,120,246	7,416	110	12,228,738

*See note page 31.

CHAPTER EIGHT

THE COAL MINING, COKE, NATURAL GAS, PEAT AND PETROLEUM INDUSTRIES
(Fuels) IN CANADA

The Coal Mining Industry in Canada.....	
1. General Review.....	
2. Commodity Statistics on Coal—including Tables on Output, Disposition, Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption, and World Output.....	
The Coke Industry in Canada.....	
The Peat Industry in Canada.....	
The Petroleum Industry in Canada.....	
1. Production of Crude Petroleum.....	
2. Petroleum Refining.....	

NOTE.—In order to correlate data regarding fuels in Canada, this chapter has been prepared to include statistics of the coal, natural gas, peat and petroleum industries. This survey presents information in detail regarding these industries as a whole, dealing principally with the mineral industry although supplementary data are shown for closely allied manufacturing operations.

THE COAL MINING INDUSTRY

Canada's coal output of 17,564,293 tons in 1928 set up a new high record, surpassing the 1927 mark of 17,426,861 tons by nearly 1 per cent. The principal increase in output was in Alberta where a 6 per cent advance in production was recorded. Greater tonnages were also produced in New Brunswick, Saskatchewan and British Columbia. Nova Scotia's output was 4.7 per cent lower than in the preceding year.

Gains were recorded in the tonnages of lignite and sub-bituminous coal mined in Canada during 1928; the output of bituminous was slightly less than in 1927. Nova Scotia, New Brunswick, British Columbia, and the Yukon produce only bituminous coal; Saskatchewan mines yield lignite only; Alberta produces bituminous, sub-bituminous and lignite, and formerly also mined some anthracite but the only anthracite mine has been closed down since 1923.

Tonnages lost in 1928 through temporary stoppages in work due to lack of orders, absenteeism, mine disability, car shortages, or other miscellaneous causes were estimated at 4,915,000 tons. It is also estimated that labour disputes at the coal mines in 1928 which involved 5,578 men with a consequent loss in working time of 86,921 days were the cause of a further loss of 272,453 tons.

Canadian coal shipped from the mine for domestic and industrial consumption averaged \$3.71 per ton, f.o.b. mine in 1928, as compared with \$3.65 per ton in 1927. Lignite coal shipments averaged \$2.99 per ton; Saskatchewan producers receiving \$1.84 per ton, while Alberta mine operators obtained an average of \$3.15 per ton for this grade. Bituminous coal shipments brought \$3.96 per ton at the mine on the average; in the several provinces the average per ton receipts were as follows:—Nova Scotia, \$4.04; New Brunswick, \$4.17; Alberta, \$3.52; and British Columbia, \$4.29. Shipments of sub-bituminous coal from Alberta mines averaged \$3.08 per ton.

Imports of anthracite and bituminous coal from Great Britain during 1928 totalled 670,612 tons as against 928,544 tons imported in the previous year. In 1927, imports of anthracite from the United States totalled 3,265,411 tons; from Great Britain, 788,235 tons; and from other countries, 9,973 tons, making a total of 4,063,619 tons. During 1928, anthracite imports included 3,203,231 tons from the United States, 526,467 tons from Great Britain, and 7,635 tons from Belgium, British South Africa, the Netherlands and Russia. Imports from Russia amounted to 6,204 tons, shipments of anthracite were received from this country in December, 1928, for the first time.

Steady employment throughout the year was afforded 14,429 employees in the coal mines in eastern Canada; and in the western Canada mines less than the usual summer seasonal decline in employment was observed. In 1928, the average number of employees in this industry was 30,256 as compared with 29,772 in the previous year. Salaries and wages advanced to a total of \$43,320,811 as compared with \$38,955,967 in 1927. Wage-earners as distinct from salaried employees, working in the coal mines of Canada in 1928 totalled 28,754; of these 6,522 worked on the surface and 22,232 underground. Surface men worked on an average 277 days and underground men, 241 days. Total man-day's work done during the year was 7,167,010; this number divided into the total wages paid showed an average daily earning power per man of \$5.57. In 1927, the computed average was \$5.03 and in 1926 the average was \$4.97.

Capital actually employed by the companies operating in the coal mining industry in Canada during 1928 was \$146,835,825. Fuel used in the operation of the coal mines during the year was valued at \$3,213,544 and consisted principally of bituminous, sub-bituminous and lignite coal; small quantities of gasoline and kerosene were also used. Purchased electricity cost \$446,177 for 29,598,802 k.w.h. in addition to which 108,926,689 k.w.h. were generated by the operating firms for their own use. A further quantity of 4,157,361 k.w.h. was produced, and sold for use outside the coal industry. Primary power employed consisted of 546 units rated at 122,775 h.p. and electric motors to a total of 1,549 units with a rating of 76,815 h.p. were in use in 1928. Boilers numbered 473, rated at 85,016 b.h.p.

In addition to the consumption of 34.4 million tons of coal, Canadian domestic and industrial concerns used large quantities of coke, manufactured and natural gas, fuel oil and electricity. Coke manufactured in 1928 amounted to 2,314,127 tons; sales totalled 951,401 tons; exports were 25,058 tons, while the imports of coke were recorded at 1,060,029 tons. The coal equivalent of the coke imported was 1,630,812 tons. Coke made available for consumption during the year amounted to 3,349,098 tons.

Manufactured gas is largely used for household purposes and in 1928 the sales of gas in Canada totalled 15,607,000, thousand cubic feet.

Natural gas consumed for domestic purposes amounted to 14,372,000 thousand cubic feet; industrial users utilised 7,576,000 thousand cubic feet. The domestic consumption was sufficient to displace approximately 575,000 tons of coal.

Fuel oil consumption in Canada for industrial and domestic purposes has increased very materially. In 1928, the total quantity of fuel oil made available for consumption in Canada was 435,327,021 imperial gallons. A survey of the Canadian acute fuel area, Ontario and Quebec, in 1928 showed a total distribution for domestic use of over 34,263,000 imperial gallons of fuel oil indicating a possible displacement of 244,000 tons of coal.

Table 204.—Capital Employed in the Coal Mines of Canada, by Provinces, as at December 15, 1927 and 1928

Province	1927				1928			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	46,918,464	3,444,755	6,758,456	57,121,675	47,063,302	3,184,255	6,999,893	57,247,450
New Brunswick...	1,401,391	30,747	94,326	1,526,464	1,432,033	24,687	188,584	1,645,304
Saskatchewan...	3,600,898	46,940	141,233	3,789,071	3,746,791	61,512	162,999	3,971,302
Alberta.....	46,611,981	1,072,809	7,759,852	55,444,642	47,006,422	1,113,144	8,218,333	56,337,899
British Columbia..	25,409,332	845,139	2,053,485	28,307,956	24,593,123	703,161	2,134,586	27,430,870
Yukon.....	203,000	.....	.....	203,000	203,000	.....	.....	203,000
Canada.....	124,145,066	5,440,390	16,807,352	146,392,808	124,044,671	5,086,759	17,704,395	146,835,825

Table 205.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces, 1928

Province	Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Under-ground				
						\$	\$	\$
Nova Scotia.....	483	41	2,340	10,993	13,857	1,055,313	18,885,377	19,940,690
New Brunswick.....	25	2	126	459	612	48,800	553,447	602,247
Saskatchewan.....	29	3	111	398	541	68,374	473,520	541,894
Alberta.....	610	35	2,371	6,909	9,925	1,554,701	13,089,846	14,644,547
British Columbia.....	257	17	1,573	3,470	5,317	661,270	6,928,883	7,590,153
Yukon.....			1	3	4		1,280	1,280
Canada.....	1,404	98	6,522	22,232	30,256	3,388,458	39,932,353	43,320,811

Table 206.—Wage-Earners in the Coal Mines of Canada by Months and by Provinces, 1927 and 1928

Month and year	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
January.....1927	13,473	551	706	10,790	5,184		30,764
.....1928	13,498	587	726	11,512	5,330		31,653
February.....1927	13,480	571	654	10,175	5,198		30,078
.....1928	13,444	573	603	10,245	5,231		30,096
March.....1927	13,351	603	524	8,604	5,116		28,198
.....1928	13,501	565	521	9,174	5,147		28,908
April.....1927	13,227	552	352	7,080	5,044		26,255
.....1928	13,504	529	333	7,669	4,800		26,835
May.....1927	12,922	541	316	6,782	4,873		25,434
.....1928	13,617	523	307	6,837	4,879		26,163
June.....1927	13,285	528	300	6,925	4,844		25,882
.....1928	13,528	532	298	7,200	4,983	4	26,545
July.....1927	13,227	543	297	7,477	4,757	3	26,304
.....1928	13,433	527	304	7,698	4,958	4	26,924
August.....1927	13,184	552	327	8,409	4,811	2	27,285
.....1928	13,271	516	318	8,633	4,892	4	27,634
September.....1927	13,273	541	432	8,917	4,964	2	28,129
.....1928	12,950	549	457	9,376	5,042	4	28,378
October.....1927	13,469	582	662	9,576	5,114		29,403
.....1928	12,913	843	738	10,412	5,269		30,175
November.....1927	13,424	551	789	10,808	5,268		30,840
.....1928	13,162	612	773	11,181	5,047		30,775
December.....1927	13,496	590	740	11,647	5,293		31,766
.....1928	13,172	661	719	11,417	4,943		30,912
Average.....1927	13,317	558	509	8,932	5,038	3	28,357
.....1928	13,333	585	509	9,280	5,043	4	28,754

Table 207.—Wage-Earners Employed, Days' Work Done by Months in the Coal Mines of Canada, 1928

Month	Number of wage-earners			Days' work done		
	Surface	Under-ground	Total	Surface	Under-ground	Total
January.....	7,007	24,646	31,653	163,408	490,843	654,251
February.....	6,743	23,353	30,096	148,355	424,027	572,382
March.....	6,484	22,424	28,908	145,976	422,838	568,814
April.....	6,201	20,634	26,835	128,730	352,610	481,340
May.....	6,133	20,030	26,163	137,650	398,668	536,318
June.....	6,246	20,299	26,545	151,392	427,041	578,433
July.....	6,318	20,606	26,924	144,509	418,039	562,548
August.....	6,446	21,188	27,634	159,141	470,603	629,744
September.....	6,476	21,902	28,378	149,478	455,350	604,828
October.....	6,697	23,478	30,175	167,434	527,444	694,878
November.....	6,780	23,995	30,775	161,841	509,106	670,947
December.....	6,713	24,199	30,912	150,269	462,258	612,527
Total for 1928.....				1,808,183	5,358,827	7,167,010

Table 208.—Wage-Earners Employed in the Coal Mines of Canada, by Classes and by Provinces, 1928

Classification	Province						Canada		
	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Surface	Under-ground	Total
SURFACE—									
Administration.....	77	13	8	98	28	.....	200	24	224
Foremen and clerks.....	154	17	14	230	126	.....	523	18	541
Screenmen and loaders.....	657	29	32	705	176	.....	1,529	70	1,599
UNDERGROUND—									
Officials.....	483	8	7	324	156	.....	13	965	978
Hand cutters and helpers.....	1,469	409	223	2,432	1,583	1	.....	6,117	6,117
Machine cutters.....	1,832	5	19	420	62	.....	.....	2,338	2,338
Machine loaders and helpers.....	1,343	10	53	1,544	132	.....	.....	3,082	3,082
Horse haulage employees.....	767	1	45	626	393	1	31	1,802	1,833
Mechanical haulage employees.....	1,685	7	9	369	344	.....	73	2,341	2,414
Ventilation employees.....	367	.....	2	89	46	.....	3	501	504
Roadmakers.....	292	5	18	177	85	.....	6	571	577
Timbermen.....	871	13	7	345	189	.....	18	1,407	1,425
Pumpmen.....	113	2	8	43	38	.....	7	197	204
MISCELLANEOUS—									
Enginemen.....	208	12	10	170	83	.....	459	24	483
Firemen.....	155	4	13	117	64	.....	348	5	353
Machinists.....	222	1	2	76	71	.....	363	9	372
Carpenters and masons.....	113	4	8	64	83	.....	271	1	272
Other mechanics.....	294	2	5	107	130	.....	324	214	538
All other white employees.....	2,231	43	26	1,344	810	2	2,104	2,352	4,456
Japanese.....	.....	.....	.....	.....	54	.....	1	53	54
Chinese.....	.....	.....	.....	.....	389	.....	249	140	389
Indians.....	.....	.....	.....	.....	1	.....	.....	1	1
Total.....	13,333	555	509	9,280	5,043	4	6,522	22,232	28,754

2.—Commodity Statistics on Coal

Including Tables on Output, Disposition, Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption and World Production

Table 209.—Output of Coal from Canadian Mines, 1785-1928

Year	Short tons	Value	Average per ton	Year	Short tons	Value	Average per ton
		\$	\$			\$	\$
1785-1866.....	2,863,826	4,905,462	1.71	1898.....	4,173,108	8,224,288	1.97
1867.....	631,320	1,056,725	1.67	1899.....	4,925,051	10,283,497	2.09
1868.....	623,392	1,073,061	1.72	1900.....	5,777,319	13,742,178	2.38
1869.....	687,825	1,155,282	1.68	1901.....	6,486,325	12,699,243	1.96
1870.....	752,635	1,243,139	1.65	1902.....	7,466,681	15,210,877	2.04
1871.....	3,033,152	5,073,331	1.67	1903.....	7,960,364	15,942,833	2.00
1872.....				1904.....	8,254,595	16,592,231	2.01
1873.....				1905.....	8,667,948	17,520,263	2.02
1874.....				1906.....	9,762,601	19,732,019	2.02
1875.....	1,063,742	1,763,423	1.66	1907.....	10,511,426	24,381,842	2.32
1876.....	1,039,974	1,747,016	1.68	1908.....	10,886,311	25,194,573	2.31
1877.....	994,762	1,729,546	1.74	1909.....	10,501,475	24,781,236	2.36
1878.....	1,036,670	1,794,415	1.73	1910.....	12,909,152	30,909,779	2.39
1879.....	1,089,744	1,941,285	1.78	1911.....	11,323,388	26,467,646	2.34
1880.....	1,126,497	2,050,639	1.82	1912.....	14,512,829	36,019,044	2.48
1881.....	1,482,714	2,657,194	1.79	1913.....	15,012,178	37,334,940	2.49
1882.....	1,537,106	2,688,821	1.75	1914.....	13,637,529	33,471,801	2.45
1883.....	1,848,148	3,248,446	1.76	1915.....	13,267,023	32,111,182	2.42
1884.....	1,818,684	3,109,635	1.71	1916.....	14,483,395	38,817,481	2.68
1885.....	1,984,959	3,593,831	1.81	1917.....	14,046,759	43,199,831	3.08
1886.....	1,920,977	3,417,807	1.78	1918.....	14,977,926	55,192,896	3.68
1887.....	2,116,653	3,739,840	1.77	1919*.....	13,919,096	55,622,670	3.99
1888.....	2,429,330	4,388,206	1.81	1920.....	16,946,764	82,496,538	4.86
1889.....	2,602,552	4,674,140	1.80	1921*.....	15,057,493	72,451,656	4.81
1890.....	2,658,303	4,894,287	1.84	1922*.....	15,157,431	65,518,497	4.32
1891.....	3,084,682	5,676,247	1.84	1923*.....	16,990,571	72,058,986	4.24
1892.....	3,577,749	7,019,425	1.94	1924*.....	13,638,197	53,593,988	3.93
1893.....	3,287,745	6,363,757	1.95	1925*.....	13,134,968	49,261,951	3.75
1894.....	3,783,499	7,359,080	1.93	1926*.....	16,478,131	59,875,094	3.63
1895.....	3,847,070	7,429,468	1.94	1927*.....	17,426,861	61,867,463	3.55
1896.....	3,478,344	6,739,153	1.93	1928*.....	17,564,293	63,757,833	3.66
1897.....	3,745,716	7,226,462	1.93				
1898.....	3,786,107	7,303,597	1.93				
				Total.....	439,791,065	1,291,397,076	

*For the years 1919-1928 the tonnage shown is the total output from all mines; for previous years the tonnage shown includes only sales, colliery consumption, and coal used by the operators.

Table 210.—Output and Value of Coal in Canada by Kinds and by Provinces, 1927 and 1928

(Short tons)

Province	1927			1928		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
			\$			\$
NOVA SCOTIA (Bituminous).....	40	7,071,876	27,194,671	40	6,743,504	27,427,556
NEW BRUNSWICK (Bituminous).....	14	203,950	885,038	15	207,738	869,104
SASKATCHEWAN (Lignite).....	55	470,216	868,867	58	471,713	831,491
ALBERTA—						
Bituminous.....	17	2,984,513	10,369,290	19	3,215,494	11,190,180
Sub-bituminous.....	24	596,155	1,784,973	20	740,496	2,076,212
Lignite.....	251	3,353,494	9,827,805	240	3,380,340	10,266,022
Total.....	292	6,934,162	21,982,058	279	7,336,330	23,532,414
BRITISH COLUMBIA (Bituminous).....	35	2,746,243	10,934,777	34	2,804,594	11,094,353
YUKON (Bituminous).....	1	414	2,052	1	414	2,915
CANADA—						
Bituminous.....	107	13,006,996	49,385,818	109	12,971,744	50,584,108
Sub-bituminous.....	24	596,155	1,784,973	20	740,496	2,076,212
Lignite.....	306	3,823,710	10,696,672	298	3,852,053	11,097,513
Total.....	437	17,426,861	61,867,463	427	17,564,293	63,757,833

Table 211.—Disposition of Coal from Canadian Mines, 1927 and 1928

	1927			1928		
	Total coal	Total value	Average value per ton	Total coal	Total value	Average value per ton
		\$	\$		\$	\$
Supplied to employees for domestic consumption.....	201,299	672,398	3.34	191,996	643,710	3.35
Used for power purposes—						
(a) Shops.....	10,503	36,344	3.46	93,911	340,215	3.62
(b) Colliery boilers.....	939,243	2,808,909	2.99	844,846	2,574,641	3.05
(c) Companies' railroads.....	78,436	298,706	3.80	73,479	288,902	3.93
(d) Harbour tugs and dredges.....	1,570	7,806	4.91	1,432	5,761	4.02
Shipped—						
(a) Ships' bunkers.....	515,109			543,223		
(b) Railroads.....	4,840,574		3.65	5,296,510		
(c) Other.....	10,306,774	57,179,464		10,179,749	59,364,965	3.71
Used in making coke at colliery.....	145,754	517,462	3.55	103,719	368,204	3.55
Used in making briquettes.....	19,046	70,418	3.69	22,883	85,808	3.75
Put on bank.....	836,605	2,869,590	3.43	727,519	2,817,034	3.87
Put on waste heap.....	318,161			299,104		
Total disposition.....	18,213,079	64,461,097	3.53	18,378,371	66,489,249	3.62
Lifted from bank.....	786,218	2,593,634	3.29	814,078	2,731,407	3.36
Total output.....	17,426,861	61,867,463	3.55	17,564,293	63,757,833	3.62

Table 212.—Disposition of Coal from Canadian Mines by Provinces, 1927

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	121,366	3,243	3,731	48,545	24,414		201,299
Coal shipped.....	6,356,620	191,293	440,796	6,510,621	2,162,916	211	15,662,457
Used under colliery boilers, etc.....	458,110	6,728	22,624	249,473	202,310	3	939,248
Used by companies' railroads.....	51,361	1,253	2,887	8,081	14,854		78,436
Used for manufacture of coke at colliery.....				229	145,525		145,754
Used in making briquettes.....				19,046			19,046
Used in shops, etc.....	10,503						10,503
Used by harbour tugs and dredges.....	1,570						1,570
Put on bank.....	712,174	6,509	1,086	44,733	72,103		836,605
Put on waste heap.....	18,545	52	514	105,016	193,834	200	318,161
Total disposition.....	7,730,249	209,078	471,638	6,985,744	2,815,956	414	18,213,079
Lifted from bank.....	658,373	5,128	1,422	51,582	69,713		786,218
Total output.....	7,071,876	203,950	470,216	6,934,162	2,746,243	414	17,426,861

Table 213.—Disposition of Coal from Canadian Mines by Provinces, 1928

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	121,551	3,305	2,916	41,856	22,368		191,996
Coal shipped.....	6,157,049	195,008	429,975	6,895,221	2,341,940	289	16,019,482
Used under colliery boilers, etc.....	366,829	7,723	35,038	240,209	195,042	5	844,846
Used by companies' railroads.....	47,338	1,380	2,933	7,471	14,357		73,479
Used for manufacture of coke at colliery.....					103,719		103,719
Used in making briquettes.....				22,883			22,883
Used in shops, etc.....	93,911						93,911
Used by harbour tugs and dredges.....	1,432						1,432
Put on bank.....	599,774	13,367	2,006	58,942	53,430		727,519
Put on waste heap.....	19,523	55	652	121,546	157,208	120	299,104
Total disposition.....	7,407,407	220,838	473,520	7,388,128	2,888,064	414	18,378,371
Lifted from bank.....	663,903	13,100	1,807	51,793	83,470		814,078
Total output.....	6,743,504	207,738	471,713	7,336,330	2,804,594	414	17,564,292

Table 214.—Shipments of Coal from Canadian Mines by Grades and Destinations, 1927 and 1928

(Short tons)

Destination	1927				1928			
	Run-of-mine	Screened	Slack	Total	Run-of-mine	Screened	Slack	Total
Prince Edward Island.....	3,411	73,069	8,788	85,268	5,784	71,007	1,271	78,062
Nova Scotia.....	297,117	534,515	797,888	1,629,520	346,213	610,082	680,185	1,636,480
New Brunswick.....	214,043	266,730	132,199	612,972	212,875	134,139	117,283	464,297
Quebec.....	50,294	1,194,541	1,062,350	2,307,185	66,447	1,172,220	1,143,579	2,382,246
Ontario.....	1,160	10,620	12,845	24,625	515	35,489	9,277	45,281
Manitoba.....	173,483	442,528	232,294	848,305	157,133	428,167	243,110	828,410
Saskatchewan.....	213,029	1,042,130	394,106	1,649,265	227,241	1,097,591	408,959	1,733,791
Alberta.....	273,319	610,615	605,228	1,489,162	256,865	562,641	593,022	1,412,528
British Columbia.....	45,222	625,861	330,150	1,001,233	92,470	636,044	389,368	1,117,882
Yukon.....		211		211		289		289
Total domestic shipments.....	1,271,078	4,800,820	3,575,848	9,647,746	1,365,543	4,747,669	3,586,054	9,699,266
Railroads.....	3,985,339	541,983	331,756	4,859,078	4,330,869	568,028	397,613	5,296,510
Ships' bunkers.....	300,304	210,089	4,716	515,109	304,536	225,300	13,387	543,223
Total railroads and ships' bunker.....	4,285,643	752,072	336,472	5,374,187	4,635,405	793,328	411,000	5,839,733
United States.....	12,821	128,613	65,788	207,222	14,636	122,602	60,237	197,475
Newfoundland.....	47,288	223,226	8,947	279,461	5,310	262,950	7,135	275,395
West Indies.....								
Europe.....								
United Kingdom and Irish Free State.....	145,682			145,682				
Other places.....	1,358	6,801		8,159	486	7,127		7,613
Lost at sea.....								
Total external shipments....	207,149	358,640	74,735	640,524	20,432	392,679	67,372	480,483
Total.....	5,763,870	5,911,532	3,987,055	15,662,457	6,021,380	5,933,676	4,064,426	16,019,482

Table 215.—Tonnage Lost in the Coal Mines of Canada in 1926-1928 Showing by Provinces the Relative Percentages Produced and Lost with an Analysis of the Percentage Lost.

Province	Per cent produced	Per cent lost	Percentage lost through				
			Absenteeism	Lack of orders	Car shortage	Mine disability	Other causes
NOVA SCOTIA.....1926	81	19	3.4	10.8	0.5	2.7	1.6
1927	78	22	3.0	13.1	0.2	3.8	1.9
1928	75	25	4.8	16.0	0.0	2.8	1.4
NEW BRUNSWICK.....1926	82	18	2.8	8.4	0.6	0.4	5.8
1927	91	9	1.6	1.9	0.1	0.5	4.9
1928	88	12	0.6	6.5	0.0	0.1	4.8
SASKATCHEWAN.....1926	65	35	0.1	32.5	0.1	0.6	1.7
1927	68	32	0.0	30.3	0.0	0.1	1.6
1928	57	43	7.7	33.5	0.3	0.1	1.4
ALBERTA.....1926	74	26	0.9	21.2	0.5	0.5	2.9
1927	78	22	1.1	16.7	1.5	0.6	2.1
1928	79	21	0.8	15.3	1.9	0.7	2.3
BRITISH COLUMBIA.....1926	81	19	1.8	16.3	0.0	0.4	0.5
1927	87	13	2.2	9.9	0.2	0.0	0.7
1928	88	12	1.5	8.2	1.3	0.1	0.9
CANADA.....1926	78	22	2.0	16.5	0.3	1.2	2.0
1927	79	21	1.9	14.5	0.8	1.9	1.9
1928	78	22	2.7	15.1	1.0	1.4	1.8

Table 216.—Imports of Anthracite and Bituminous Coal into Canada from Great Britain, by Grades and by Provinces, 1927-1928

(Short tons)

Destination	1927			1928		
	Anthracite		Bituminous, all grades	Anthracite		Bituminous, all grades
	Egg, nut etc.	Dust		Egg, nut, etc.	Dust	
Prince Edward Island.....	3,210					
Nova Scotia.....	29,864			29,314		4,381
New Brunswick.....	31,192		17	34,061		1,083
Quebec.....	687,252	22,457	140,267	428,203	13,262	137,549
Ontario.....	10,494			19,407		
British Columbia.....	3,766		25	2,220		1,132
Canada.....	765,778	22,457	140,309	513,205	13,262	144,145

Table 217.—Imports of Anthracite Coal into Canada from the United States by Grades and by Provinces, 1926-1928

(Short tons)

Destination	1926		1927		1928	
	Egg, nut, etc.	Dust	Egg, nut, etc.	Dust	Egg, nut, etc.	Dust
Prince Edward Island.....	5,344		3,814		3,765	
Nova Scotia.....	39,186	8	29,522		29,815	
New Brunswick.....	61,432	272	69,540	928	37,432	2,183
Quebec.....	1,051,662	201,584	765,754	187,083	739,266	162,889
Ontario.....	2,389,779	115,311	2,061,663	130,692	2,065,158	151,993
Manitoba.....	13,981	4,009	12,752	3,133	8,321	1,809
Saskatchewan.....	464		484		579	
Alberta.....						
British Columbia.....	752		46			21
Canada.....	3,562,690	321,184	2,943,575	321,836	2,884,336	318,895

Table 218.—Imports of Bituminous and Lignite Coal into Canada from the United States by Provinces, 1926-1928

(Short tons)

Destination	1926		1927		1928	
	Bituminous	Lignite	Bituminous	Lignite	Bituminous	Lignite
Prince Edward Island.....	1,622		5,050		4,076	
Nova Scotia.....	23,921		37,155		27,473	
New Brunswick.....	97,548		95,559		49,484	
Quebec.....	1,793,990		1,572,692		1,303,607	
Ontario.....	11,696,108		13,158,927		12,318,948	
Manitoba.....	149,374		142,860		97,002	
Saskatchewan.....	1,887		2,141		2,536	60
Alberta.....	1,515		1,324		1,360	
British Columbia.....	31,960	10,384	22,292	10,829	17,510	10,720
Yukon.....	10		8		40	
Canada.....	13,797,935	10,384	15,038,008	10,829	13,822,036	10,780

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Table 219.—Imports of Anthracite and Bituminous Coal into Canada from Other Countries, by Provinces, 1926, 1927 and 1928

(Short tons)

De tination	Source	1926			1927			1928		
		Anthracite		Bitu- minous, all grades	Anthracite		Bitu- minous, all grades	Anthracite		Bitu- minous, all grades
		Egg,nut, etc.	Dust		Egg,nut, etc.	Dust		Egg,nut, etc.	Dust	
Nova Scotia.....	Germany.....	2,240								
	Netherlands.....			100						
Quebec.....	Germany.....	42,902	2,818		4,818					
	Netherlands.....	32,934	4,821		5,155			1,102		
	Belgium.....							328		
	Brit. S. Africa.....							6,204		
	Russia.....									
	Newfoundland.....									
Ontario.....	Germany.....	1,758								2
	Netherlands.....	47								
British Columbia.....	Japan.....			303			323			
Canada.....		79,881	7,639	403	9,973		323	7,635		2

Table 220.—Average Imports of Coal into Canada by Kinds and by Provinces for the Five Years 1924-1928

(Short tons)

Destination	Anthracite			Total bitumin- ous	Total all grades
	Egg, nut, etc.	Dust	Total		
Prince Edward Island.....	4,967		4,967	7,398	12,365
Nova Scotia.....	55,123	1	55,124	67,892	123,016
New Brunswick.....	85,476	863	86,339	97,088	183,427
Quebec.....	1,274,933	177,716	1,452,649	1,817,091	3,269,740
Central Ontario.....	2,203,383	109,495	2,312,878	10,154,407	12,467,285
Head of Lakes.....	67,100	429	67,529	1,404,901	1,472,430
Total Ontario.....	2,270,483	109,924	2,380,407	11,559,308	13,939,715
Manitoba.....	18,712	3,813	22,525	136,120	158,645
Manitoba and Head of Lakes	85,812	4,242	90,054	1,541,021	1,631,075
Saskatchewan.....	783	7	790	2,183	2,973
Alberta.....	6		6	1,317	1,323
British Columbia.....	2,433	4	2,437	43,249	45,686
Yukon.....				17	17
Canada.....	3,712,916	292,328	4,005,244	13,731,663	17,736,907

Table 221.—Average Imports of Coal into Central Canada by Principal Areas for the Five Years 1924-1928

(Short tons)

Destination	Anthracite			Total bitumin- ous	Total all grades
	Egg, nut, etc.	Dust	Total		
Quebec.....	88,391	4,754	93,145	193,911	287,056
Montreal.....	1,162,988	171,931	1,334,919	1,516,410	2,851,329
Ottawa.....	239,086	39,467	278,553	875,913	1,154,466
Kingston.....	103,844	2,031	105,875	215,326	321,201
Toronto.....	1,572,498	65,210	1,637,708	4,920,130	6,557,838
Windsor.....	287,977	3,247	291,224	3,068,538	3,359,762
Total.....	3,454,784	286,640	3,741,424	10,790,228	14,531,652

Table 222.—Exports of Canadian Coal by Destination, 1926-1928

(Compiled in the *External Trade Branch*)

Destination	1926		1927		1928	
	Short tons	Value	Short tons	Value	Short tons	Value
		\$		\$		\$
BRITISH EMPIRE						
United Kingdom.....	93,620	620,490	62,163	451,451	27,390	202,252
Irish Free State.....	81,600	489,964	131,218	682,295	484	3,003
British South Africa.....	9,200	55,890	8,923	67,865	4,578	27,468
Bermuda.....	619	4,510	646	5,315	198	1,595
British Guiana.....					1,066	6,393
British India.....			157	1,413	514	4,266
British West Indies—						
Jamaica.....			575	3,536	3,017	25,040
Other B.W.I.....	1,845	15,056	353	2,910		
Gibraltar.....	1,607	11,442	790	4,740	3,924	23,892
Malt.....					161	1,328
Newfoundland.....	276,116	1,484,290	281,872	1,473,336	246,100	1,301,592
Sierra Leone.....	3,256	19,533	1,247	7,794	433	3,572
Australia.....	19,257	149,004	23,895	182,730	22,458	186,310
New Zealand.....	1,197	7,182	15,479	90,663	6,994	40,214
Total British Empire.....	488,317	2,857,361	528,318	2,974,048	317,317	1,826,925
FOREIGN COUNTRIES						
Argentina.....	4,725	39,217			4,046	24,276
Belgium.....	10,334	74,699	10,988	76,074	7,354	49,695
Brazil.....	1,210	6,050			4,046	24,276
Chile.....	666	3,996				
China.....			2,155	15,192	499	4,141
Cuba.....	635	5,191	194	1,676	1,015	8,531
Denmark.....	2,150	14,235	909	5,762	513	3,163
Egypt.....	1,114	9,277	236	2,006		
Finland.....					147	882
France.....	23,584	151,293	3,218	23,116	1,701	11,666
French Possessions—						
French Africa.....			226	1,356	1,737	10,419
French Oceania.....			637	3,758		
Morocco.....			144	1,296		
St. Pierre and Miquelon.....	3,328	19,040	5,291	32,380	5,742	34,831
Syria.....					333	1,998
Germany.....	5,725	40,717	10,353	71,084	5,622	36,843
Greece.....	2,995	18,762	2,027	12,264	3,283	20,139
Haiti.....	338	1,690				
Honduras.....					276	1,380
Iceland.....	203	1,218			135	844
Italy.....	16,378	110,904	18,108	113,814	8,181	50,338
Japan.....	13,183	89,223	6,664	47,635	5,970	38,870
Mexico.....	1,827	14,304	7,002	58,116		
Netherlands.....	5,298	33,833	5,590	31,885	7,467	55,120
Norway.....	1,337	7,346	3,863	21,243	1,764	11,142
Panama.....	832	6,593				
Peru.....	446	2,676				
Poland and Danzig.....					398	2,461
Portugal.....	898	5,388	598	3,588	1,672	12,829
Azores and Maderia.....						
Portuguese Africa.....						
Russia.....	5,734	47,592			361	2,166
Spain.....			501	3,006	3,221	19,512
Canary Islands.....	7,648	37,769				
Sweden.....			477	2,911		
Turkey.....					680	4,080
United States.....	404,134	1,950,992	477,362	2,163,374	455,495	2,028,482
Alaska.....	24,710	187,364	27,150	216,713	22,298	168,381
Philippines.....						
Porto Rico.....					294	1,650
Virgin Islands.....			518	3,056		
Uruguay.....	451	2,706	801	5,006	2,021	12,631
Total foreign countries.....	539,883	2,882,075	585,012	2,916,311	546,624	2,643,074
Total.....	1,028,200	5,739,436	1,113,330	5,890,359	863,941	4,469,999

Table 223.—Annual Consumption of Coal in Canada, 1902-1928

Calendar year	Canadian†		Imported coal "entered for consumption"					Total	Per capita
			From U.S.A.	From Great Britain	Total*		Short tons		
	Short tons	%	Short tons	Short tons	Short tons	%		Short tons	Short tons
1902.....	5,376,413	53.1	4,656,286	101,726	4,734,559	46.9	10,110,972	1.848	
1903.....	6,005,735	47.3	6,520,931	184,593	6,678,450	52.7	12,684,185	2.212	
1904.....	6,697,183	47.9	7,238,869	85,687	7,297,482	52.1	13,994,665	2.412	
1905.....	7,032,661	49.4	7,233,738	68,500	7,215,446	50.6	14,249,107	2.341	
1906.....	7,927,560	50.5	7,787,338	67,014	7,758,325	49.5	15,685,885	2.481	
1907.....	8,617,352	45.0	10,588,697	54,325	10,549,503	55.0	19,166,855	2.947	
1908.....	9,156,478	47.3	10,203,335	97,514	10,195,424	52.7	19,351,902	2.820	
1909.....	8,913,376	47.9	9,805,253	67,671	9,711,826	52.1	18,625,202	2.682	
1910.....	10,532,103	50.2	10,545,451	51,541	10,437,123	49.8	20,970,226	2.960	
1911.....	9,822,749	40.5	14,510,129	48,963	14,424,949	59.5	24,247,698	3.365	
1912.....	12,385,696	46.0	14,557,124	38,668	14,549,104	54.0	26,934,800	3.657	
1913.....	13,450,158	42.6	18,145,769	37,825	18,132,387	57.4	31,582,545	4.196	
1914.....	12,214,403	45.5	14,687,853	33,101	14,637,920	54.5	26,852,323	3.490	
1915.....	11,500,480	48.1	12,450,796	15,098	12,406,212	51.9	23,906,692	3.041	
1916.....	12,348,036	41.3	17,576,202	4,401	17,517,820	58.7	29,865,856	3.717	
1917.....	12,313,603	37.2	20,848,009	9,451	20,810,132	62.8	33,123,735	4.049	
1918.....	13,160,731	37.8	21,674,826	3,761	21,611,101	62.2	34,771,832	4.175	
1919.....	11,611,168	40.3	17,292,913	344	17,236,269	59.7	28,847,437	3.402	
1920.....	14,025,566	42.9	18,752,981	.....	18,668,741	57.1	32,694,307	3.788
1921.....	12,715,734	41.1	18,300,081	1,591	18,258,387	58.9	30,974,121	3.524	
1922.....	13,044,352	50.2	12,255,555	765,980	12,962,189	49.8	26,006,541	2.909	
1923.....	15,070,982	41.8	20,417,239	572,570	20,967,971	58.2	36,038,933	3.968	
1924.....	12,529,358	42.8	16,405,344	317,112	16,714,143	57.2	29,243,501	3.100	
1925.....	12,125,290	42.6	15,744,957	604,117	16,331,971	57.4	28,457,261	3.039	
1926.....	15,449,831	48.3	16,204,405	287,299	16,565,555	51.7	32,015,386	3.329	
1927.....	16,313,531	46.6	17,769,963	907,210	18,680,832	53.4	34,994,363	3.676	
1928.....	16,700,352	49.3	16,515,149	682,755	17,200,043	50.7	33,900,395	3.510	

†The sum of Canadian coal mine sales, colliery consumption, coal supplied to employees, and coal used in making coke, etc., less the tonnage of coal exported.

*Includes small tonnages from countries other than Great Britain and United States. Deductions have been made to take account of foreign coal re-exported from Canada.

Table 224.—Summary Statistics for 1928-Output, Exports, Interprovincial Shipments, Imports and Coal made Available for Consumption in Canada, by Provinces

(Short tons)

Province	Canadian coal				Imported from U.S.A.	Imported from Great Britain	Imported from other countries	Coal available for consumption
	Output	Received from other provinces	Shipped to other provinces	Exported				
PRINCE EDWARD ISLAND—								
Anthracite.....					3,765			3,765
Bituminous.....		78,062		76	4,076			82,062
Total.....		78,062		76	7,841			85,827
NOVA SCOTIA—								
Anthracite.....					29,815	29,314		59,129
Bituminous.....	6,743,504		2,864,254	344,379	27,473	4,381		3,566,725
Total.....	6,743,504		2,864,254	344,379	57,288	33,695		3,625,854
NEW BRUNSWICK—								
Anthracite.....					39,615	34,061		73,676
Bituminous.....	207,738	400,684	101	25,740	49,484	1,083		633,148
Total.....	207,738	400,684	101	25,740	89,099	35,144		706,824
QUEBEC—								
Anthracite.....					902,155	441,465	(a) 7,635	1,351,255
Bituminous.....		2,382,246		440	1,303,607	137,549	(b) 2	3,822,964
Total.....		2,382,246		440	2,205,762	579,014	7,637	5,174,219
CENTRAL ONTARIO—								
Anthracite.....					2,159,657	19,407		2,179,064
Bituminous.....		33		4	10,643,002			(c) 10,643,031
Sub-bituminous.....		13,061						13,061
Lignite.....		32,187		32				32,155
Total.....		45,281		36	12,802,659	19,407		12,867,311
MANITOBA AND HEAD OF LAKES—								
Anthracite.....					67,624			67,624
Bituminous.....		47,340		479	1,772,948			1,819,809
Sub-bituminous.....		96,250						96,250
Lignite.....		684,820		3,609				681,211
Total.....		828,410		4,088	1,840,572			2,664,894
SASKATCHEWAN—								
Anthracite.....					579			579
Bituminous.....		139,454		52	2,536			141,938
Sub-bituminous.....		85,915						85,915
Lignite.....	471,713	1,341,217	223,551	7,754	60			1,581,685
Total.....	471,713	1,566,586	223,551	7,806	3,175			1,810,117
ALBERTA—								
Anthracite.....								
Bituminous.....	3,215,494	56,097	220,840	241	1,360			3,051,870
Sub-bituminous.....	740,496		234,003					506,493
Lignite.....	3,380,340		1,970,026	602				1,409,712
Total.....	7,336,330	56,097	2,424,869	843	1,360			4,968,075
BRITISH COLUMBIA—								
Anthracite.....					21	2,220		2,241
Bituminous.....	2,804,594	93,348	112,069	458,093	17,610	1,132		2,346,422
Sub-bituminous.....		38,777						38,777
Lignite.....		135,353		22,440	10,720			123,633
Total.....	2,804,594	267,478	112,069	480,533	28,251	3,352		2,511,073
YUKON—								
Bituminous.....	414				40			454
Total.....	414				40			454
CANADA—								
Anthracite.....					3,203,231	526,467	7,635	3,737,333
Bituminous.....	12,971,744	3,197,264	3,197,264	829,504	13,822,036	144,145	2	26,108,423
Sub-bituminous.....	740,496	234,003	234,003					740,496
Lignite.....	3,852,053	2,193,577	2,193,577	34,437	10,780			3,828,396
Total.....	17,564,293	5,624,844	5,624,844	863,941	17,036,047	670,612	7,637	34,414,648

(a) Includes 6,204 tons from Russia, 1,102 tons from the Netherlands, 328 tons from British South Africa and 1 ton from Belgium.

(b) Imported from Newfoundland.

(c) In addition to this quantity, 63,427 tons of Nova Scotia coal were shipped to Ontario from stock at Montreal.

Table 225.—World Production of Coal* 1924-1928

(Including brown coal)

(Long tons)

Country	1924	1925	1926	1927	1928
BRITISH EMPIRE					
Great Britain—					
Anthracite.....	5,425,643	6,126,389	2,876,655	6,346,890	5,521,570
Bituminous.....	261,692,524	237,049,842	123,401,866	244,885,446	231,950,361
Lignite.....			(a)	502	640
Nigeria (b).....	220,161	238,966	324,575	357,899	359,316
Southern Rhodesia.....	582,187	678,320	860,338	894,396	1,077,557
Union of South Africa.....	11,633,370	12,127,188	12,745,492	12,381,692	12,407,539
Canada—					
Anthracite.....					
Bituminous.....	8,467,618	7,981,792	11,065,249	11,666,961	11,581,914
Sub-bituminous.....	526,936	509,513	437,264	532,281	661,157
Lignite.....	3,182,408	3,236,345	3,210,104	3,414,027	3,439,333
British Borneo—					
British North Borneo.....	90,000	79,941	71,638	62,701	60,779
Brunei.....	18,323				
Sarawak.....	18,959	19,678	19,683	(a)	(a)
Federated Malay States.....	372,795	408,084	464,284	463,001	556,590
India—					
Gondwana Coalfields.....	20,696,338	20,447,898	20,583,202	21,664,488	22,153,314
Tertiary Coalfields.....	477,946	456,479	415,965	417,848	389,558
Australia—					
Bituminous.....	13,757,500	13,626,777	13,250,000	13,522,960	11,839,780
Lignite.....	127,490	876,468	957,935	1,455,482	1,591,858
New Zealand—					
Bituminous.....	1,085,004	1,044,726	1,196,388	1,290,529	1,348,732
Brown coal.....	839,017	911,425	905,825	954,436	973,238
Lignite.....	159,186	158,844	137,786	121,775	114,783
Total.....	329,373,405	305,978,675	192,924,249	320,433,314	306,028,019
FOREIGN COUNTRIES					
Austria—					
Bituminous.....	169,195	142,907	154,824	172,828	198,906
Brown coal.....	2,741,044	2,985,470	2,911,015	3,015,675	3,211,042
Belgium—					
Anthracite and semi-anthracite.....	5,067,144	4,769,356	5,247,611	5,899,589	27,107,780
Bituminous.....	17,919,307	17,962,898	19,613,048	21,216,242	
Bulgaria—					
Bituminous.....	68,550	71,827			
Brown coal.....	1,126,766	1,131,353	1,186,713	1,218,099	1,407,736
Czechoslovakia—					
Bituminous.....	14,934,995	12,360,640	13,953,092	13,794,932	14,330,345
Brown coal.....	20,130,874	18,310,843	18,223,237	19,310,756	20,128,419
France—					
Saar.....	13,806,602	12,784,692	13,464,803	13,391,097	12,899,716
Other districts—					
Anthracite and bituminous.....	43,311,590	46,353,460	50,579,865	50,960,760	50,554,526
Lignite.....	947,048	977,663	1,044,363	1,050,434	1,046,891
Germany—					
Bituminous.....	116,859,965	130,527,542	143,000,979	151,173,466	148,492,939
Brown coal.....	122,634,103	137,517,857	136,952,867	148,126,913	163,598,878
Greece—					
Brown coal.....	129,002	139,832	150,899	141,082	118,734
Hungary—					
Bituminous.....	732,430	776,943	813,846	773,447	770,908
Brown coal.....	6,231,501	5,417,385	5,561,158	5,983,940	6,240,930
Lignite.....			169,185	160,839	164,838
Italy—					
Anthracite.....	11,635	14,076	15,460	16,573	10,676
Bituminous.....	103,440	171,468	190,495	149,293	115,590
Brown coal.....	902,746	1,088,015	1,162,684	898,047	686,024
Jugoslavia—					
Bituminous.....	129,518	175,638	187,800	283,184	351,826
Brown coal.....	3,070,927	2,951,589	2,965,800	3,433,470	3,608,130
Lignite.....	917,998	959,027	921,754	954,586	1,012,136
Netherlands—					
Bituminous.....	5,787,020	6,740,404	8,471,616	9,175,868	10,747,587
Brown coal.....	188,129	204,344	207,858	198,201	193,589
Poland—					
Bituminous.....	31,706,783	28,622,028	35,182,768	37,482,601	39,974,905
Brown coal.....	86,623	64,638	74,825	77,225	72,398
Portugal—					
Anthracite.....	125,782	133,306	197,353	174,520	(a)
Bituminous.....			3,546	1,300	(a)
Brown coal.....	7,900	17,716	30,760	25,307	(a)
Rumania—					
Anthracite.....	148				
Bituminous.....	292,363	308,620	317,102	367,559	391,285
Brown coal.....	2,439,241	2,573,973	2,688,224	2,804,999	2,588,144

Table 225.—World Production of Coal* 1924-1928—Concluded

(Including brown coal)

(Long tons)

Country	1924	1925	1926	1927	1928
Russia—					
Anthracite.....		3,292,173	5,279,743	6,979,046	
Bituminous—					
European.....	12,400,000	9,850,930	15,009,393	18,565,382	34,657,125
Asiatic.....	1,400,000	1,603,818	2,830,323	3,891,329	
Brown coal.....	1,514,000	1,492,943	2,256,761	2,590,882	
Spain—					
Anthracite.....	311,108	311,047	396,494	423,106	406,906
Bituminous.....	5,717,998	5,709,680	6,036,364	6,036,177	5,683,532
Brown coal.....	405,155	396,330	393,515	422,817	352,848
Spitzbergen and Bear Island.....	444,651	406,768 (e)	286,531	308,000	(a)
Sweden.....	430,819	259,711	377,613	392,007	352,851
Algeria.....	9,080	9,879	13,514	20,932	16,368
Belgian Congo.....	80,000	80,000	88,800	86,000	88,000
Portuguese East Africa.....			10,696	15,584	(a)
Tunis (brown coal).....	300				
Greenland.....	2,500	2,500	2,500	2,900	2,500
Mexico.....	1,206,981	1,421,684	1,288,462	1,015,020	999,787
United States—					
Anthracite.....	78,506,217	55,193,883	75,390,582	71,513,896	67,275,062
Bituminous (c).....	431,862,980	464,332,804	511,934,808	464,111,000	439,954,131
Brazil.....	263,847	386,070	400,000	231,294	246,327
Chile.....	1,514,405	1,430,277	1,466,968	1,458,113	(a)
Colombia (estimated).....			100,000	100,000	100,000
Peru.....	152,029	100,142	168,063	159,806	(a)
Venezuela.....	24,426	24,528	15,676	15,850	(a)
China (d).....	20,632,000	21,000,000	22,000,000	18,000,000	(a)
Dutch East Indies.....	1,446,731	1,378,602	1,443,200	1,594,616	(a)
Formosa.....	1,482,240	1,677,659	1,766,169	1,772,005	1,513,000
French Indo-China—					
Anthracite.....	1,151,757	1,288,888	1,226,943	1,422,083	1,883,409
Bituminous.....	59,769	46,907	37,428	38,041	39,826
Brown coal.....	4,492	5,648	5,510	7,038	15,228
Japan—					
Semi-anthracite.....	108,554	88,458	128,322	141,181	
Bituminous.....	29,518,348	30,874,100	30,801,888	32,859,856	33,325,406
Brown coal.....	173,923	166,750	158,589	175,792	145,397
Karafuto.....	196,181	246,657	271,463	351,407	(a)
Korea.....	392,996	614,379	672,111	723,000	(a)
Philippine Islands.....	46,518	47,183	47,912	23,040	(a)
Turkey in Asia (f).....	756,713	733,235	1,215,095	892,310	917,924
New Caledonia.....		1,300	15,000	(a)	(a)
Total.....	1,004,797,087	1,040,730,443	1,149,181,986	1,128,772,342	1,098,000,505
Total.....	1,334,170,492	1,346,709,118	1,342,106,235	1,449,205,656	1,404,028,524

*Data obtained from *The Mineral Industry of the British Empire and Foreign Countries*.

(a) Data not available.

(b) Years ended 31st March of the year following that stated.

(c) Including brown coal.

(d) Approximate production.

(e) Exports.

(f) Héraclée-Zoungouldak coal basin.

COKE

Output of gas-house and by-product coke in Canada during 1928 totalled 2,314,127 tons, an increase of 287,689 tons over the total for the previous year. This tonnage established a new record, being 14 per cent greater than the previous high mark of 2,027,058 tons in 1926. By-product coke plants produced 1,980,591 tons in 1928 while only 333,536 tons were obtained from artificial gas plants. In addition, 95,908 tons of petroleum coke were recovered as a by-product of petroleum refining.

Of the 45 plants in the coke and gas industry, 37 were in the illuminating and fuel gas section and 8 in the coke section. These plants were located as follows: 2 in Nova Scotia; 2 in New Brunswick; 4 in Quebec; 22 in Ontario, 7 in Manitoba, 1 each in Saskatchewan and Alberta, and 6 in British Columbia. The total capital employed by the operating companies in 1928 was \$92,145,190. Employment was afforded 3,914 salaried employees and wage-earners whose earnings were \$5,608,779.

Production of gas totalled 35,058,920 M cubic feet of which 11,867,124 M cubic feet were produced in gas plants and 23,191,796 M cubic feet in by-product coke ovens. Sales of gas reached 15,606,609 M cubic feet worth \$13,933,537; most of the remaining gas was used for fuel in the reporting plants or associated metallurgical works. Coke-oven gas for industrial or domestic purposes was sold by 2 firms in Ontario and 1 in Quebec. In addition to the output shown above, 2,489,346 M cubic feet of still gas were made in petroleum refineries for their own use.

Table 226.—Production in Canada, Imports and Exports of Coke and its By-Products, 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
*Coal charged to ovens or retorts—		\$		\$		\$
(a) In coke plants:						
Domestic..... tons	938,134	3,041,854	809,135	2,704,159	829,157	2,730,503
Foreign..... tons	1,254,866	6,379,663	1,431,345	7,420,374	1,876,502	9,171,157
(b) In gas plants:						
Bituminous—Domestic..... tons	80,923	416,645	118,221	732,642	80,382	414,460
Foreign..... tons	620,360	3,857,538	506,608	3,035,897	413,118	2,502,888
Anthracite..... tons	3,477	41,277	225	3,130	1,317	15,362
Total..... tons	2,897,760	13,736,977	2,865,534	13,896,202	3,200,476	14,834,370
<i>Coke—</i>						
PRODUCTION—by provinces—						
Nova Scotia and New Brunswick..... tons	484,760	2,373,863	417,380	2,020,953	463,093	2,189,648
Quebec..... tons	162,169	891,485	144,538	794,959	240,204	1,736,843
Ontario..... tons	1,144,493	8,208,124	1,260,355	8,542,988	1,443,512	9,332,926
Manitoba..... tons	34,509	371,715	35,641	386,071	34,641	337,446
British Columbia..... tons	201,127	1,460,738	168,524	1,219,241	132,677	988,848
Total..... tons	2,027,058	13,805,925	2,026,438	12,964,212	2,314,127	14,535,711
IMPORTS..... tons	988,034	6,566,686	772,235	4,742,224	1,060,029	6,102,842
EXPORTS..... tons	41,699	316,154	74,109	533,638	25,058	183,728
APPARENT CONSUMPTION..... tons	2,973,393	19,556,457	2,724,564	17,172,798	3,349,098	20,464,825
<i>Other Products</i>						
†PRODUCTION—						
Ammonium sulphate..... tons	23,655	1,015,578	24,708	1,030,991	28,090	1,108,744
Gas: (a) Sales..... M cu.ft.	13,799,693	14,936,071	14,658,495	15,653,591	15,606,609	13,933,537
(b) Used in own plants..... M cu.ft.	6,551,401	1,064,809	6,312,346	1,136,816	7,058,981	1,369,655
(c) Used in metallurgical works..... M cu.ft.	10,255,336	1,210,754	10,560,393	1,268,200	11,237,155	1,295,644
(d) Not accounted for..... M cu.ft.	1,352,392	.....	1,324,935	.....	1,156,175	211,327
Light oils..... imp. gal.	3,260,958	424,776	2,965,583	316,557	4,052,859	500,365
Tar and tar products..... imp. gal.	24,949,885	1,494,786	25,647,309	1,631,276	27,141,332	1,721,452
Ammonia liquor..... Pound N.H ₃	3,430,683	63,973	1,438,888	38,034	1,644,516	25,867
All other products.....	366,412	.....	5,072	.....	.....	6,145
IMPORTS—						
Ammonium sulphate..... tons	2,298	135,455	3,181	160,150	3,510	174,899
Coal tar and pitch..... gal.	3,681,324	256,061	3,812,637	286,307	5,065,142	366,249
EXPORTS—						
Ammonium sulphate..... tons	16,382	813,115	16,947	730,815	13,632	561,696
Tar and pitch..... gal.	4,642,453	374,395	2,914,642	277,793	3,572,781	311,031

*Includes the consumption in companies' own coke plants and in associated metallurgical works.

†Production data include the output of the Coke and its By-products Industry and of the Illuminating and Fuel Gas Industry.

NATURAL GAS

Canada ranks second in the world's production of natural gas. In 1928, the natural gas industry contributed 3.1 per cent of the total value of all minerals produced in Canada. Production during the year totalled 22,582,586 M cu. ft. valued at \$8,614,182, a new high record for the industry. In 1927, the production was 21,376,791 M cu. ft. with a valuation of \$8,043,010. Capital employed by the companies operating in Canada has advanced 104 per cent since 1921, and a proportionate increase has been recorded in the number of employees in the industry and in salaries and wages paid.

Production of natural gas is attaining ever-increasing importance in Alberta. The principal producing fields in this province in 1928, were: the Turner Valley (about 35 miles southwest of Calgary); Medicine Hat; Viking (about 80 miles southeast of Edmonton); Redcliff; Foremost (about 6 miles south and east of the town of Foremost); Bow Island; and Wetaskiwin. Wainwright was supplied with gas from the Maple Leaf well in the Fabyan field; gas from the Barnwell and Bassano fields was also used in 1928.

In Medicine Hat, large industrial firms use natural gas for fuel. Three flour mills, the city power house (in which gas is used in boiler plants) and 3 clay products plants are the largest industrial consumers of this product. Redcliff, 2 miles west of Medicine Hat has 6 wells; the industrial users of this gas are the Dominion Glass Company and 3 clay products plants. Calgary and Edmonton, the largest cities in the province, are being supplied with natural gas. In Calgary there are over 15,500 domestic and 24 industrial consumers; in Edmonton, more than 8,400 domestic and 239 industrial users. Lethbridge and Wetaskiwin, and many towns are also being served by natural gas. Many drilling companies in the province also make use of gas fuel in their operations. Calgary is supplied principally with natural gas from the Turner Valley field. This gas is stripped of the naphtha, then the sulphur content is removed by scrubbing and the gas is transmitted to Calgary through pipe lines. Calgary consumers also use considerable quantities of natural gas piped from the Bow Island and Foremost fields.

Conditions in Ontario's natural gas fields during 1928 are described by Col. R. B. Harkness, Commissioner of Natural Gas, for the province, as follows:

"The most important developments in the natural gas industry in 1928 were in the transmission and distribution of natural gas, rather than in production.

So far as production was concerned, there was some "wild-catting" without any results. The gas field in Dawn township, Lambton County, was extended to the easterly border of the township, but the field is small and narrow, and the limits very difficult to define. The drilling in the old Tilbury field was confined to locations in between producing wells, and, in fact, this was the experience in the Haldimand, Norfolk and Welland fields also. The Ajax Company, after drilling two wells in the old Dover field, located their third and fourth wells, one-quarter of a mile and a mile, respectively, to the east. Their fourth well, after having 500 quarts of nitroglycerine exploded in it, measured a little over 5,000,000 cu.ft. per day, thus becoming the largest gas well brought into production in Ontario during the last ten years.

In the distribution of natural gas, the Union Natural Gas Company extended their plant in Windsor over the new districts that have been built in the last three or four years. They built four hortonospheres at the city limits that hold 1,250,000 cu. ft. of gas. Gas is stored in these hortonospheres at about 50 lb. pressure, for use during peak load periods.

The Union Natural Gas Company, fearing a shortage of natural gas, let a contract to build a gas-producing plant at the city of Windsor. This will be completed in 1929, and will be used entirely as a stand by, only operating when the supply of natural gas fails. It is a most flexible gas producer, and is capable of making gas at the rate of 6,000,000 cu. ft. per day.

The experience of the Union Natural Gas Company in purifying the "sulphur gas" from the Tilbury field led the Southern Ontario Gas Company to put in a similar purification plant, and at the present time the only municipalities in Ontario that are served with "sulphur" gas are Cainsville, Leamington and the adjacent townships.

The Dominion Natural Gas Company extended their distribution plant in the newer sections of East Hamilton, and are now supplying several thousand consumers in that district. Extensions to plant have also been made in the newer sections of the city of St. Catharines."

New Brunswick's natural gas is obtained from wells in the Stony Creek field near Moncton. A pipe line carries this gas to Moncton and Hillsboro, where over 5,000 domestic and industrial users consume more than 600,000 thousand cubic feet annually.

Manitoba's production consists of a small quantity of natural gas obtained from private wells and used by the owners in their own homes.

Table 227.—Production of Natural Gas in Canada, by Provinces, 1892-1928

Year	New Brunswick		Ontario		Manitoba		Alberta		Canada	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
		\$		\$		\$		\$		\$
1892.....				150,000						150,000
1893.....				376,233						376,233
1894.....				313,754						313,754
1895.....				423,032						423,032
1896.....				276,301						276,301
1897.....				325,873						325,873
1898.....				322,123						322,123
1899.....				387,271						387,271
1900.....				417,094						417,094
1901.....				339,476						339,476
1902.....				195,992						195,992
1903.....				196,535				5,675		202,210
1904.....				253,524				74,852		328,376
1905.....				316,476				63,085		379,561
1906.....				533,446				50,077		583,523
1907.....				746,499				68,533		815,032
1908.....				949,297				63,363		1,012,660
1909.....				1,145,307				61,722		1,207,029
1910.....				1,271,303				75,168		1,346,471
1911.....				1,807,513				110,165		1,917,678
1912.....		36,549		2,036,245				289,906		2,326,700
1913.....	828,603	174,147	12,474,745	2,055,768			7,174,400	1,079,466	20,477,838	3,309,381
1914.....	425,826	54,249	14,094,521	2,215,808			7,172,157	1,214,670	21,692,504	3,484,737
1915.....	430,692	60,383	15,211,523	2,622,838			4,481,947	1,022,814	20,124,162	3,706,065
1916.....	610,118	79,628	17,953,109	2,765,105			6,904,231	1,113,296	25,467,458	3,958,029
1917.....	796,775	103,735	19,868,035	3,641,587			6,744,130	1,299,076	27,408,940	5,045,298
1918.....	792,396	107,842	13,029,524	2,884,460			6,318,389	1,358,638	20,140,309	4,350,940
1919.....	682,890	120,510	11,024,041	2,690,400			8,230,838	1,365,127	19,937,769	4,176,037
1920.....	682,502	130,506	10,529,374	2,920,731	200	60	5,633,442	1,181,345	16,845,518	4,232,642
1921.....	708,743	139,375	8,422,774	3,080,130	200	60	4,945,884	1,374,599	14,077,601	4,594,164
1922.....	753,898	148,040	8,060,114	4,076,296	200	60	5,868,439	1,622,105	14,682,651	5,846,501
1923.....	640,300	126,068	8,128,413	4,066,244	200	60	7,191,670	1,692,246	15,960,583	5,884,618
1924.....	599,972	113,577	7,150,078	3,798,381	200	60	7,131,036	1,796,618	14,881,336	5,708,636
1925.....	639,235	122,394	7,143,962	3,958,006	200	60	9,119,500	2,752,545	16,902,897	6,833,005
1926.....	648,316	128,300	7,764,996	4,409,593	200	60	10,794,697	3,019,221	19,208,209	7,557,174
1927.....	630,755	124,637	7,311,215	4,331,780	200	60	13,434,621	3,586,533	21,376,791	8,043,010
1928.....	660,981	324,344	7,632,800	4,535,312	200	60	14,288,605	3,754,466	22,582,586	8,614,182
Total	*10,532,002	2,094,284	*175,799,224	66,835,733	1,800	540	*125,434,126	30,096,211	*311,767,152	99,026,765

* Total quantity produced, 1913 to 1928.

Table 228.—Capital Employed in the Natural Gas Industry in Canada by Provinces, 1927 and 1928

	1927				1928			
	New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
	\$	\$	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—								
Cost of lands, buildings, plant, machinery and tools.....	—	26,930,822	21,175,361	48,106,183	—	31,064,794	22,330,394	53,395,188
Cost of supplies and stocks on hand.....	—	646,361	213,521	859,882	—	620,221	270,555	890,776
Cash, trading and operating accounts and bills receivable.....	—	5,344,667	2,195,359	7,540,026	—	5,186,892	2,329,528	7,516,420
Total	271,000	32,921,850	23,584,241	†56,777,091	271,000	36,871,907	24,930,477	†62,073,384

† Includes data for New Brunswick.

Table 229.—Number of Gas Wells in Canada, by Provinces, 1926, 1927 and 1928

		New Brunswick	Ontario	Manitoba	Alberta	Canada
Productive wells at beginning of year.....	1926	32	2,117	1	86	2,236
	1927	*35	2,126	2	84	2,247
	1928	26	2,172	3	86	2,287
Number of productive wells drilled.....	1926	3	86		3	92
	1927	3	119		3	125
	1928	2	126		2	130
Number of dry wells drilled.....	1926	1	35		1	37
	1927		30		1	31
	1928		51		2	53
Number of wells abandoned.....	1926		78		1	79
	1927		62		1	63
	1928		54		5	59
Productive wells at end of year.....	1926	35	2,126	2	84	2,247
	1927	*38	2,172	2	86	2,298
	1928	28	1,922	3	84	2,037

*Includes 12 oil wells from which gas was obtained.

Table 230.—Natural Gas Wells in Ontario, by Townships, 1927 and 1928

Township	1927				1928			
	No. of producing wells in operation Dec. 31, 1927	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year	No. of producing wells in operation Dec. 31, 1928	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year
Amabel.....	2				2			
Ancaster.....								
Bayham.....	41	1			40			
Bertie.....	88	1			85	3		
Binbrook.....	46	1			43	3		
Brantford.....								
Caledon E.....	6			3	2			
Caistor.....	15				15			
Canboro.....	130	12		3	111	1		
Cayuga, North.....	90	7	7	16	81	4	8	17
Cayuga, South.....	60	1	2	4	38	3	2	3
Charlotteville.....	16				13			
Crowland.....	51			2	48	5		2
Dawn.....	10		3	4	13		4	4
Dover, West.....	7				8	1		3
Dunn.....	30		2	8	30	1	5	1
Enniskillen.....	3	3		3	3	1		1
Euphemia.....	6				6			
Gainsboro.....	4				4			
Glanford.....	20	1			11	6	4	1
Gosfield.....	19			5	20			1
Houghton.....	3				3			
Humberstone.....	89	3			81	2		2
Mersea.....	3				2			
Middleton.....	26		2	2	23	1		
Malahide.....	2				2			
Moulton.....	105	3			91	10		
Oneida.....	23	2			23			
Onondaga.....	29	2		2	32	1		
Rainham.....	120	4	3	24	105	1	5	23
Raleigh.....	16				14			1
Romney.....	130	3	2	21	117	1	2	10
Sarnia.....	14	2			14			
Seneca.....	130	7	1	5	120	8	3	6
Sherbrooke.....	12	1			11			
Tilbury, East.....	130	4		3	128	4		12
Townsend.....	1				1			
Tuscarara.....					3			7
Wainfleet.....	39	4			37			2
Walpole.....	165	2	7	13	81	1	11	18
Walsingham, N.....	8			3	9			1
Walsingham, S.....	15				9			
Windham.....	8			1	5			
Willoughby.....	39				39			
Woodhouse.....	49	1	1		28		2	6
Private wells.....	300				300	6	2	6
Surface wells.....	72				71	1		
Total.....	2,172	62	30	119	1,922	64	51	126

Table 231.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927							
Prince Edward Island and New Brunswick..	4	2	16	22	\$ 17,900	20,944	38,844
Ontario.....	292	95	636	1,023	472,200	598,328	1,070,528
Alberta.....	73	18	206	297	174,947	251,179	426,126
Canada.....	369	115	858	1,342	665,047	870,451	1,535,498
1928							
New Brunswick.....	4	3	14	21	18,005	22,575	40,580
Ontario.....	317	112	859	1,288	571,414	928,163	1,499,577
Alberta.....	88	22	241	351	229,500	335,991	565,491
Canada.....	409	137	1,114	1,660	818,919	1,236,729	2,105,648

* See note page 31.

Table 232.—Wage-Earners in the Natural Gas Industry in Canada, by Months and by Provinces, 1927 and 1928

Month	1927				1928			
	New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
January.....	14	310	116	440	5	420	155	580
February.....	12	365	121	498	5	372	157	534
March.....	12	396	139	547	5	439	170	614
April.....	21	470	149	640	19	845	182	1,046
May.....	25	500	178	703	23	1,031	258	1,312
June.....	25	714	255	994	23	1,113	330	1,466
July.....	25	780	268	1,073	20	1,138	350	1,508
August.....	24	788	305	1,117	15	1,087	327	1,429
September.....	8	883	261	1,152	19	1,101	243	1,363
October.....	7	929	269	1,205	15	1,099	242	1,356
November.....	10	805	230	1,045	12	751	203	966
December.....	5	553	150	708	6	580	183	769

PEAT

In May 1928, the peat manufacturing plant at Alfred, Ontario commenced operations. Production was continued until September, 1928, and 10,000 tons of peat fuel were laid on the field. Of this quantity 6,000 tons were harvested, including over 5,000 tons laid down at the railway siding and about 750 tons on the field. By the end of the year 1,200 tons of peat fuel had been shipped from the bog. In addition to this 297 tons of humus were sold for soil dressing.

Table 233.—Production of Peat in Canada, 1900-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1900.....	400	1,200	1910.....	841	2,604	1921.....	1,666	6,664
1901.....	220	600	1911.....	1,463	3,817	1922.....	3,000	14,500
1902.....	475	1,663	1912.....	700	2,900	1923-24.....		
1903.....	1,100	3,300	1913.....	2,600	10,100	1925.....	1,370	8,394
1904.....	800	2,400	1914.....	685	2,470	1926-1927.....		
1905.....	80	260	1915.....	300	1,050	1928.....	1,497	5,845
1906.....	474	1,422	1916.....	300	1,500			
1907.....	50	200	1917-18.....			Total.....	23,677	96,520
1908.....	60	180	1919.....	986	6,561			
1909.....	60	240	1920.....	4,550	18,650			

THE PETROLEUM INDUSTRY IN CANADA

Including (1) Production of Crude Petroleum; and (2) Petroleum Refining

1. Production of Crude Petroleum

Production of crude petroleum is speedily attaining a place of prime importance in Canada's mineral industry. Capital employed in this enterprise has increased tenfold since 1921; the 1928 total was \$31,182,352. A similar trend was recorded in salaries and wages paid. In 1928 the value of the petroleum output from Canadian wells was a record, when production amounted to 624,184 barrels worth \$2,035,300 as compared with the totals for 1927 of 476,591 barrels at \$1,516,043.

Alberta is the leading producing province, the output of the Turner Valley wells accounting for 98.4 per cent of the total for the province. Production of heavy crude oil in the Wainwright field in 1928 amounted to 7,671 barrels. Thirty-one wells were in operation in Alberta at the close of the year and drilling was in progress on 61 other wells. Drilling operations were continued during 1928 in the Turner Valley, Wainwright, Ribstone and other fields in Alberta; the total footage drilled during the year was 197,029 feet.

Conditions in the oil fields of Ontario showed little change in 1928. A slight decrease was recorded in the production of petroleum during 1928. According to Col. R. B. Harkness, a number of oil companies operated at a loss and kept their wells in operation only through hope of better prices. Extensive inquiry has been made into the methods of increasing the recovery of oil in the old fields and an American company, with this in view, is said to be contemplating the use of methods practised in Pennsylvania and New York oil fields.

Wells in the Stony Creek field, New Brunswick, produced 8,043 barrels during 1928.

Saskatchewan activities in this industry were confined to operations in the Rosetown field, the Simpson field and in Unity Valley, near Vera.

Imports of petroleum and its products into Canada in 1928 were valued at \$61,675,989, an increase of \$8,797,272 or 16.6 per cent over the 1927 total of \$52,878,717. Asphalt and asphaltum oil imports are not included in the above total; in 1928 these importations had a value of \$964,877. In 1928 Canada purchased over 68 per cent of its imported crude petroleum from the United States; about 19 per cent from Colombia; 9 per cent from Peru; and smaller quantities from Venezuela, Mexico, and Ecuador. Gasoline imports, principally from the United States, totalled 143,653,116 imperial gallons appraised at \$16,812,418.

Canada has not yet been able to produce a sufficient supply of crude petroleum to permit the export of oil to other countries, so the foreign trade in petroleum is largely a matter of import trade into Canada. There are, however, some international dealings between the western United States and Canada's western provinces that are of interest. Crude oil imported from the Montana field has been treated in Alberta's refineries for the recovery of gasoline that finds ready market for the operation of automobiles and tractors on the prairies. There is less market in the Canadian west for the fuel-oil fraction, and, as a result, it has been the practice to export quantities of this oil to points in the western States, where it finds a ready sale.

Canada's exports of gasoline have grown in the past eight years from 164,433 gallons in 1920 to 3,957,557 gallons in 1928. Newfoundland, the United States, Alaska, British Guiana and St. Pierre and Miquelon are Canada's principal customers in this respect. In the export classification there is an item of "Oil, petroleum, crude," representing a considerable volume of trade, amounting to more than 21 million gallons in 1928; it is understood that this item represents the exports of fuel oil previously noted. There has been a fairly consistent export of coal oil or kerosene during the past seven years; in 1928 the export trade in this commodity consisted of 76 per cent to the neighbouring country of Newfoundland, 17 per cent to British Guiana, and minor amounts to St. Pierre and Miquelon, Alaska, Barbados, the United States and Bermuda.

Table 234.—Production of Crude Petroleum in Canada by Provinces, 1881-1928

(Barrel = 35 Imp. gal.)

Year	New Brunswick		Ontario		Alberta		Canada	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$		\$
1881.....			368,987				368,987	
1882.....			389,573				389,573	
1883.....			472,866				472,866	
1884.....			571,000				571,000	
1885.....			587,563				587,563	
1886.....			584,061	525,655			584,061	525,655
1887.....			713,728	556,708			713,728	556,708
1888.....			695,203	713,695			695,203	713,695
1889.....			704,690	653,600			704,690	653,600
1890.....			795,030	902,734			795,030	902,734
1891.....			755,298	1,010,211			755,298	1,010,211
1892.....			779,753	984,438			779,753	984,438
1893.....			798,406	874,255			798,406	874,255
1894.....			829,104	835,322			829,104	835,322
1895.....			726,138	1,086,738			726,138	1,086,738
1896.....			726,822	1,155,647			726,822	1,155,647
1897.....			709,857	1,011,546			709,857	1,011,546
1898.....			758,391	1,061,747			758,391	1,061,747
1899.....			808,570	1,202,020			808,570	1,202,020
1900.....			710,498	1,151,007			710,498	1,151,007
1901.....			622,392	1,008,275			622,392	1,008,275
1902.....			530,624	951,190			530,624	951,190
1903.....			486,637	1,048,874			486,637	1,048,874
1904.....			503,474	935,895			503,474	935,895
1905.....			634,095	856,028			634,095	856,028
1906.....			569,753	761,760			569,753	761,760
1907.....			788,872	1,057,088			788,872	1,057,088
1908.....			527,987	747,102			527,987	747,102
1909.....			420,755	559,604			420,755	559,604
1910.....	1,485	1,826	314,410	386,724			315,895	398,550
1911.....	2,461	3,019	288,631	354,054			291,092	357,073
1912.....	2,679	3,799	240,657	341,251			243,336	345,050
1913.....	2,111	3,762	225,969	402,677			228,080	406,439
1914.....	1,725	2,742	212,693	338,182	387	2,200	214,805	343,124
1915.....	1,020	1,423	214,444	299,149		†	215,464	300,572
1916.....	1,345	2,663	196,778	389,621		†	198,123	392,284
1917.....	2,341	5,460	202,991	473,477	8,500	63,302	213,832	542,239
1918.....	3,009	7,402	288,692	777,737	13,040	100,004	304,741	885,143
1919.....	4,225	13,141	219,804	625,342	16,437	97,841	240,466	736,324
1920.....	5,148	19,963	180,071	726,286	11,032	75,986	196,251	822,235
1921.....	7,479	33,022	172,859	559,198	7,203	49,313	187,541	641,533
1922.....	7,778	32,732	164,731	526,316	6,559	52,128	179,068	611,176
1923.....	8,826	35,642	159,400	478,149	1,943	8,227	170,169	522,618
1924.....	5,561	21,313	154,368	441,952	844	4,135	160,773	467,400
1925.....	5,376	18,756	143,134	386,555	183,491	845,394	332,001	1,250,705
1926.....	10,544	29,940	137,850	379,221	216,050	902,504	364,444	1,311,665
1927.....	18,244	41,748	139,606	288,347	318,741	1,185,948	476,591	1,516,043
1928.....	8,043	21,391	134,094	249,737	482,047	1,764,172	624,184	2,035,300
Total.....	99,409	299,744	22,361,309	*30,075,114	1,266,274	5,151,154	23,726,983	*35,526,012

* Total value from 1886 to 1928.

† Small production—no record.

Table 235.—Production of Crude Petroleum in Canada by Provinces, 1927 and 1928

Province	1927		1928	
	Barrels	Total value	Barrels	Total value
		\$		\$
NEW BRUNSWICK.....	18,244	41,748	8,043	21,391
ONTARIO—				
Petrolia and Enniskillen.....	60,171	123,235	60,547	111,745
Oil Springs.....	37,282	78,749	35,653	68,086
Moore Township.....	2,014	4,116	2,148	3,952
Sarnia Township.....	1,679	3,433	1,221	2,246
Plympton Township.....	493	1,008	371	683
Bothwell.....	25,184	51,437	24,255	44,621
West Dover.....	602	1,216	773	1,422
Raleigh Township.....	276	575		
Onondaga.....	210	736	116	406
Moza Township.....	7,456	15,219	7,268	13,371
Thamesville.....	4,139	8,420	1,006	1,851
Tilbury East.....	60	120	736	1,354
Euphemia.....	40	83		
Total for Ontario.....	139,606	288,347	134,094	249,737
ALBERTA.....	318,741	1,185,948	482,047	1,764,172
Canada.....	476,591	1,516,043	624,184	2,035,300

Table 236.—Petroleum Wells in Canada, by Provinces, 1927 and 1928

	New Brunswick	Ontario	Alberta	Canada
Productive wells at beginning of year.....	1927 17 1928 23	2,758 2,669	10 19	2,785 2,711
Number of productive wells drilled.....	1927 1928 2	8 3	8 13	16 18
Number of wells abandoned.....	1927 1928	198 91	7 2	205 93
Number of dry wells drilled.....	1927 1928	4 .....	..... 6	4 6
Number of productive wells at end of year.....	1927 17 1928 25	2,669 2,643	19 21	2,705 2,699

Table 237.—Imports into Canada and Exports of Petroleum and its Products, 1926-1928

	1926		1927		1928		
	Quantity	Value	Quantity	Value	Quantity	Value	
		\$		\$		\$	
IMPORTS—							
Crude petroleum in its natural state, .7900 specific gravity or heavier at 60 degrees temperature, when imported by oil refiners to be refined in their own factories.....	gals.	570,383,547	31,338,734	684,269,831	31,043,180	853,889,703	35,237,350
Crude petroleum, gas oils other than naphtha, benzine and gasoline lighter than .8235 but not less than .775 specific gravity at 60 degrees.....	gals.	60,562	6,159	398,046	30,043	247,624	20,269
Petroleum, crude, not in its natural state, .725 specific gravity or heavier but not heavier than .770 specific gravity at 60 degrees temperature, when imported by oil refiners to be refined in their own factories.....	gals.			45,500	4,226	263,771	26,378
Petroleum (not including crude petroleum imported to be refined or illuminating or lubricating oils) .8235 specific gravity or heavier at 60 degrees temperature.....	gals.	97,050,028	4,006,369	81,343,133	3,524,132	62,680,093	2,452,504
Petroleum, and other oils, imported by miners or mining companies or concerns for use in the concentration of ores or metals in their own concentrating establishments.....	gals.	133,439	37,133	206,332	56,435	236,516	66,727
KEROSENE AND ILLUMINATING OILS							
Coal oil and kerosene, distilled, purified or refined.....	gals.	3,611,778	404,051	4,002,839	346,848	3,950,094	353,339
Illuminating oils, composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon.....	gals.	6,210	2,919	8,389	4,155	3,952	2,959
Coal oil and kerosene, distilled, known as "engine distillate", when .725 specific gravity and heavier, but not heavier than .770 specific gravity at 60 degrees temperature.....	gals.	1,224,464	139,404	26,127	2,523	14,598	1,588
Fuel oil, ex-warehoused for ships' stores (From April 1, 1927).....	gals.			37,870,909	1,543,316	32,539,383	981,622
LUBRICATING OILS							
Lubricating oils, composed wholly or in part of petroleum, and costing less than 25 cents per gallon.....	gals.	5,180,614	959,341	5,796,327	947,128	6,797,536	1,144,645
Lubricating oils, n.o.p.....	gals.	5,079,264	2,009,214	6,741,630	2,797,435	8,690,409	3,357,818
GASOLINE AND OTHER OILS							
Gasoline under .725 specific gravity at 60 degrees temperature.....	gals.	60,105,404	8,670,438	85,432,311	8,794,848	116,062,590	13,526,618
Gasoline .725 specific gravity and heavier, but not heavier than .770 specific gravity at 60 degrees temperature.....	gals.	22,666,298	3,277,288	22,503,290	2,602,949	27,531,961	3,278,465
Gasoline, n.o.p.....	gals.	67,986	11,069	232,727	20,897	58,565	7,335
All other oils, n.o.p.....	gals.	215,337	132,120	190,983	124,033	211,832	149,548
OTHER PRODUCTS OF PETROLEUM							
Grease, axle.....	lb.	4,556,607	290,092	4,920,965	277,128	5,245,699	293,682
Paraffine wax.....	lb.	1,946,905	141,241	3,820,893	182,725	2,247,547	107,223
Paraffine wax candles.....	lb.	382,373	82,213	435,602	96,183	396,717	88,798
Vaseline and all similar preparations of petroleum for toilet, medicinal or other purposes.....			205,463		198,501		240,966
Petroleum, products of, n.o.p.....	gals.	2,247,183	350,438	1,745,896	282,032	1,860,009	332,155
Total.....			52,063,686		52,878,717		61,669,989
EXPORTS—							
Oil petroleum, crude.....	gals.	21,043,135	851,750	18,793,254	923,948	21,531,929	1,098,586
Oil, coal and kerosene, refined.....	gals.	1,584,645	192,988	1,759,838	191,533	1,297,081	127,391
Oil, gasoline and naphtha.....	gals.	3,867,536	773,958	2,463,379	431,011	3,957,557	686,256
Oil, mineral, n.o.p.....	gals.	961,577	200,562	258,251	81,147	279,946	85,014
Wax, mineral.....	cwt.	10,682	62,329	3,609	21,327	10,010	54,501
Total.....			2,081,587		1,648,966		2,051,748

Table 238.—Capital Employed in the Petroleum Industry in Canada, by Provinces, 1927 and 1928

	1927				1928			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
	\$	\$	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—								
Cost of lands, buildings, plant machinery and tools.....	2,046,056	178,000	15,193,332	17,417,388	1,958,936	250,000	22,274,176	24,483,112
Cost of supplies and stocks on hand.....	23,753	22,029	929,954	975,736	23,806	9,000	1,214,735	1,247,541
Cash, trading and operating accounts and bills receivable.....	20,981	57,417	4,302,394	4,380,792	29,181	.....	5,422,518	5,451,699
Total.....	2,090,790	257,446	20,425,680	22,773,916	2,011,923	259,000	28,911,429	31,182,352

Table 239.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1927					\$	\$	\$
Ontario.....	23		113	136	24,682	90,516	115,198
Saskatchewan.....	1	1	19	21	1,800	20,329	22,129
Alberta.....	63	22	539	624	146,277	836,620	982,897
Canada.....	87	23	671	781	172,759	947,465	1,120,224
1928							
Ontario.....	15	2	114	131	13,720	95,145	108,865
Saskatchewan.....	1	1	27	29	1,500	36,165	37,665
Alberta.....	63	13	882	958	141,380	1,628,715	1,770,095
Canada.....	79	16	1,023	1,118	156,600	1,760,025	1,916,625

*See note page 31.

Table 240.—Wage-Earners in the Petroleum Industry in Canada, by Provinces and by Months, 1927 and 1928

Month	1927				1928			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
January.....	101	1	390	492	109	1	537	647
February.....	102	1	376	479	109	1	588	698
March.....	104	1	381	486	109	1	581	691
April.....	105	8	423	536	106	6	682	794
May.....	110	12	439	561	110	20	858	988
June.....	111	18	439	568	113	27	898	1,038
July.....	105	13	475	593	110	27	917	1,054
August.....	104	13	528	645	113	27	963	1,103
September.....	101	19	561	681	107	27	907	1,041
October.....	100	19	585	704	108	27	918	1,053
November.....	98	10	632	740	102	27	871	1,000
December.....	96	.....	571	667	101	22	863	986

2. The Petroleum Refining Industry in Canada

Canada's petroleum refining and blending plants numbered 25 in 1928 and represented a capital investment in lands, buildings, machinery and general equipment amounting to \$56,531,614. This industry afforded employment to 4,319 persons, and the total payroll was \$6,922,580. Purchased fuel and electricity cost \$3,447,782 and purchased materials represented an outlay of \$57,383,841. The value added by manufacturing, representing the difference between the selling value at the refinery of the products made and the cost of the crude oils and other raw materials used, amounted to \$25,738,331.

Production of gasoline from Canadian refineries in 1928 totalled 344.1 million gallons of which 117.1 million gallons were obtained by the cracking process. The total value of gasoline production was about 52 million dollars. In the previous year only 258.5 million gallons of gasoline were made in Canada and the value was placed at about 35 million dollars.

Kerosene is still an important product; production in 1928 totalled 55.98 million gallons, as compared with 54.31 million gallons in 1927.

Fuel and gas oils have been produced in much greater quantities during the past several years than formerly. In 1920, the output of fuel and gas oils from Canadian refineries amounted to 96.4 million gallons valued at 10.3 million dollars; in 1925 the output amounted to 172.3 million gallons valued at 9.7 million dollars; in 1927 the total was 286.5 million gallons at about 13.6 million dollars, and in 1928 the final output was 361.39 million gallons at 14.45 million dollars. It is estimated that in 1928, a further 284.5 million gallons of fuel and gas oils were used in the cracking process in the various refineries.

Lubricating oils and greases, asphalt, petroleum coke, wax, and candles, are other important products made in the oil refineries.

In the separation and purification of the various products obtained by the refineries in the treatment of crude oil, large quantities of sulphuric acid, caustic soda, and other chemical products are used. It appears that the consumption of 66°Bé. sulphuric acid in petroleum refining is approximately one pound of acid to six gallons of crude oil; for caustic soda, the average seems to be about one pound to 100 gallons of oil. The consumption of containers, cooperage stock, etc., reaches large figures annually, even though some shipping containers used for oil are returnable. The total cost of materials used in manufacturing in 1928 was \$57,383,841,

Canadian refineries, situated at strategic points across the Dominion for convenience in marketing their products, treated in 1928, about 20.3 million gallons of oil from Canadian wells (including naphtha from the Turner Valley wells in Alberta), and about 829.6 million gallons of imported oils obtained chiefly from the United States, Colombia, Peru, Venezuela and Mexico.

There are now 16 plants in Canada engaged in the refining of oils for the production of gasoline, kerosene, lubricating oils, waxes, and petroleum coke. Of these, 4 are located in Ontario, 4 in Alberta, 3 in British Columbia, 2 in Quebec, and one in each of the provinces of Nova Scotia, Manitoba and Saskatchewan. Nine other plants make lubricating oils and greases as their principal product. Of these, 5 are located in Ontario, 3 in Quebec, and one in Alberta.

Table 241.—Materials Used and Products Made by the Oil Refineries of Canada, 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
MATERIALS USED—		\$		\$		\$
Crude oil, product of Canadian wells..... imp. gals.	12,203,286	1,673,632	15,632,271	1,783,413	20,324,814	2,112,314
Crude oil, imported..... imp. gals.	573,263,043	45,396,649	700,737,619	47,376,673	829,608,956	50,952,144
Sulphuric acid (66° Be) (Not made by firm reporting)..... lb.	53,919,554	423,229	49,728,504	407,894	51,828,643	408,905
Sulphur (not used in acid manufacture)..... lb.	155,076	4,283	145,980	4,498	161,044	5,105
Caustic soda..... lb.	6,216,823	234,326	3,798,427	147,684	4,345,466	159,803
Soda ash..... lb.			412,489	8,594	381,196	8,023
Litharge..... lb.	697,417	72,269	473,785	48,714	659,882	57,527
Fullers' earth..... lb.	4,784,069	50,460	8,304,713	80,611	11,707,839	109,221
Other materials.....		1,021,695		691,442		860,055
Shipping containers.....		1,907,328		2,194,007		2,360,088
Total.....		59,783,871		52,743,530		57,033,185
PRODUCTS MADE—						
Gasoline..... imp. gals.	222,146,704	40,467,868	258,549,724	35,173,348	344,129,861	52,228,842
V. M. & P. naphtha including engine distillate, etc..... imp. gals.	1,650,956	245,841	6,205,538	721,618	4,959,471	644,726
Kerosene..... imp. gals.	58,502,190	9,402,396	54,316,079	6,621,413	55,981,919	7,340,544
Fuel and gas oils..... imp. gals.	228,474,212	12,007,320	286,525,733	13,584,412	361,391,850	14,451,534
Lubricating oils..... imp. gals.	16,894,609	3,671,756	18,532,072	3,434,443	19,049,046	3,343,981
Grease..... lb.	10,903,112	218,965	11,101,247	239,818	14,443,252	260,646
Petroleum coke..... tons	51,545	307,443	76,229	449,218	95,908	561,430
Wax and candles..... lb.	9,858,490	648,303	9,526,072	505,133	17,030,063	599,341
Asphalt..... imp. gals.	20,721,103	2,035,697	21,803,479	2,287,464	22,329,392	2,019,933
Other products.....		1,564,651		962,982		994,615
Total.....		70,570,240		63,979,849		82,448,392

CHAPTER NINE

THE NON-METAL MINING INDUSTRIES IN CANADA. (Other than Fuels)

Including detailed data relating to operations in the following industries:—

Abrasives	Miscellaneous—
Asbestos	Actinolite
Feldspar	Barytes
Graphite	Bituminous sands
Gypsum	Fluorspar
Iron oxides	Lithium minerals
Mica	Magnesite
Quartz	Magnesium sulphate
Salt	Manganese, bog
Talc and soapstone.	Mineral waters
	Natro-alunite
	Phosphate
	Pyrites
	Silica brick
	Sodium carbonate
	Sodium sulphate

THE ABRASIVES INDUSTRY IN CANADA

The abrasives industry in Canada includes two main divisions: (1) The natural abrasives industry, covering the production of natural abrasives such as grindstones, pulpstones and scythestones, corundum, diatomite, volcanic dust, etc.; and (2) The artificial abrasives and abrasive products industry which covers the manufacture of silicon carbide, fused alumina, abrasive wheels, abrasive paper, etc.

Abrasives, natural

This group of industries includes the production of corundum, diatomite, garnets, grinding pebbles, grindstones, pulpstones and scythestones, and volcanic dust.

Corundum.—Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. The industry made its appearance there in 1900 and production reached a maximum in 1906. In 1921, grain corundum amounting to 403 tons valued at \$55,965 was exported to the United States. Since that date no shipments of corundum have been reported.

Diatomite.—Prior to 1928 the Canadian production of diatomite was obtained from deposits in the province of Nova Scotia. In 1896, shipments of diatomite totalling 644 tons were made; this was the first official record of production in Canada. Deposits at Silica lake and near St. Ann's, Cape Breton, have been worked. The total production to date amounts to 630 tons valued at \$230,679. Since 1912 the Oxford Tripoli Company has been the only shipper. This

company's shipments prior to 1927 were made from deposits located in the vicinity of Silica lake, Colchester county. The diatomite was calcined in rotary furnaces before shipment to a plant at Haverstraw, New York. Development work was carried on during 1926 in connection with a diatomite deposit at East New Annan, Nova Scotia and in 1927 shipments of diatomite amounting to 266 tons were made.

In 1928 shipments of diatomite amounted to 368 tons valued at \$8,960. These shipments were made from deposits at East New Annan, Nova Scotia, and Quesnel, British Columbia.

Diatomite, sometimes called tripolite, is a silicious material closely related to quartz and is used principally for heat and sound insulation, as an absorbent, a filtering medium, a filler, a mild abrasive, and as a structural material.

Garnets.—A deposit of garnets in Ashby township, Ontario, was operated during 1923 and 1,250 tons of garnet concentrates and crude garnets were shipped to Niagara Falls, New York, for use as an abrasive material. In 1924, a shipment of 360 tons of garnets was made but there has been no production from this deposit since that date. In 1927, development work was done on a garnet deposit in Joly township, Labelle county, Quebec, and a shipment of 2 tons was made. Further work was carried on from July to December, 1928 by the company operating this deposit. During 1928, a garnet deposit in Bauden township, Quebec, was being developed.

Grinding Pebbles.—Grinding pebbles have been obtained for a number of years along the shore of Lake Superior, near Jackfish, Ontario. During 1920 the production amounted to 560 tons; in 1925 the total was 105 tons; and in 1926 shipments were considerably lower, amounting to only 64 tons. During 1927 and 1928 there was no production of grinding pebbles in Canada.

The Hedley Gold Mining Company used pebbles obtained from Hedley, Similkameen district, British Columbia, in 1922. These pebbles were produced at a cost of \$4 per ton as compared with \$35 per ton for the imported Danish pebbles.

Grindstones, Pulpstones and Scythestones.—In Nova Scotia at Lower Cove near Joggins and at Minudie, grindstones were produced as early as 1750. Production from these quarries is reported to have been over 4,000 tons annually for a number of years around 1850. In 1873 shipments from Minudie amounted to 1,590 tons and in the following year the output from Lower Cove was 750 tons valued at \$12,000; and from Shore Cove 350 tons worth \$4,200.

Sandstone deposits near Pictou and Merigomish Harbour were operated between 1840 and 1865. The Mic Mac Quarry, east of Woodburn, produced grindstones up to 1927. This quarry averaged 300 tons annually from 1913 to 1926. The majority of the stones were shipped to the United States for saw and machine knife grinding.

Quarry Island has been the scene of operations for 60 years, and during the period 1870 to 1914 a production of 200 tons to 300 tons was recorded annually. However, since that time only a small quantity has been shipped each year.

In New Brunswick considerable activity was evidenced in this industry on Grindstone Island during the period 1800-1850, but since the latter date no shipments appear to have been made. From 1835 to 1885, a large number of quarries were operated in the southern part of the peninsula, between Petitcodiac and Memramcook rivers. These grindstones were exported mainly to the United States for file and spring grinding purposes. The Beaumont quarry was opened up in this district in 1899 and was closed down in 1919. In 1923, the Rockland quarry situated north of the Beaumont was opened up and since then some experimental shipments have been made.

Grindstone production started at Rockport, New Brunswick in 1815. Practically all of the stones cut since 1890 were sent to the Wood Point Plant in crude form for finishing. Prior to 1880, a small quantity of grindstones was produced from the sandstone reefs near Wood Point. From 1896 to 1906, production from these quarries ranged between 200 tons and 300 tons annually, which was increased to 800 tons to 1,000 tons during the next ten years. There have been no grindstones produced here since 1918.

In Northumberland county the production of grindstones commenced in 1870. Quarries have been operated at various points near Newcastle, but, with the introduction of Ohio stones on the New England markets operations were curtailed and only the Miramichi, Read and Fish quarries remained active.

New Brunswick grindstone quarries in operation in 1871 employed 200 men earning \$30,635 and made \$40,953 worth of products. In 1881 eight quarries were operated, seven in Gloucester county and one in Westmoreland, with a capital investment of \$10,250; a payroll of 136 men receiving \$20,975 in wages and a production valued at \$30,297. The high record for the industry, according to available information, was reached in 1907 when 4,833 tons were produced.

About 1830 the grey sandstones on the east side of Grindstone Island, the centre island of the Magdalen group in Quebec were worked by the French inhabitants and grindstones made for local use.

Some grindstones and scythestones have been shipped from sandstone deposits in Clara and Nottawasaga townships, Ontario. Shipments from the former township were made between 1870 and 1875 and from the latter between 1860 and 1870.

A sandstone quarry situated on Newcastle Island about one mile northeast of Nanaimo, British Columbia commenced shipping pulpstones in 1923. These stones are mainly of smaller sizes, although a few magazine grinders have been produced. The total production of pulpstones from this deposit to date has amounted to over 2,047 tons.

Volcanic Dust.—The extensive beds of volcanic dust that occur near Waldeck, 11 miles northeast of Swift Current, were first discovered in 1918. Shipments have been made from these deposits annually for the past five years. During 1928 production amounted to 485 tons valued at \$9,795.

Volcanic dust is used for purposes similar to ground pumice, particularly in the manufacture of cleansers and scouring powders and in some instances as a substitute for fuller's earth in the refining of hard oils and fats. The domestic market is not large, nevertheless, only about 2 per cent is supplied by the home product.

Table 242.—Capital Employed in the Natural Abrasives Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	307,549	339,166
Cost of supplies and stocks on hand.....	49,323	58,253
Cash, trading and operating accounts and bills receivable.....	76,938	51,199
Total.....	433,810	448,618

Table 243.—Wage-Earners in the Natural Abrasives Industry in Canada, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	32	10	July.....	192	180
February.....	16	10	August.....	186	158
March.....	21	12	September.....	128	109
April.....	50	40	October.....	113	83
May.....	122	126	November.....	71	72
June.....	197	158	December.....	37	90

Table 244.—Production of Corundum in Canada, 1900-1928

(Short tons)

Year	Corundum-bearing rock treated	Grain corundum graded	Per cent recovery	Shipments of grain corundum				Average price in cents per pound
				Sold in Canada	Exported	Total shipments	Total value	
	Tons	Tons		Tons	Tons	Tons	\$	
1900.....		60		3		3	300	5.00
1901.....	4,134	434	10.7	85	302	387	46,415	5.97
1902.....	7,996	805	10.1	106	662	768	84,465	5.49
1903.....	(a) 8,877	839	9.5	85	618	703	77,510	5.51
1904.....	28,187	1,654	5.9	116	877	993	109,545	5.51
1905.....	23,571	1,681	7.1	140	1,504	1,644	149,153	4.48
1906.....	45,719	2,914	6.4	162	2,112	2,274	204,973	4.50
1907.....	60,532	2,682	4.4	164	1,728	1,892	177,922	4.70
1908.....	2,678	103	4.0	99	990	1,089	100,398	4.60
1909.....	35,894	1,579	4.4	129	1,362	1,491	162,492	5.45
1910.....	37,183	1,686	4.5	106	1,764	1,870	198,680	5.31
1911.....	41,975	1,641	3.9	92	1,380	1,472	161,873	5.50
1912.....	36,879	1,620	4.4	63	1,897	1,960	239,091	6.10
1913.....	12,290	763	6.2	23	1,154	1,177	137,036	5.82
1914.....	12,111	695	5.7	14	534	548	72,176	6.59
1915.....	1,724	116	6.7	21	241	262	33,138	6.33
1916.....	1,864	67	3.6	8	59	67	10,307	7.65
1917.....	4,659	188	4.0	16	172	188	32,153	8.55
1918.....	3,184	137	4.3		137	137	26,112	9.90
1919.....	1,300	26	2.0					
1920.....	(b) 13,025	322	2.5	20	176	196	24,547	6.25
1921.....	(b) 11,256	407	3.6		403	403	55,965	6.94
1922-1928.....								
Total.....	395,038	20,422		1,452	18,072	19,524	2,104,251	

(a) In addition to this amount which was milled in Canada, 267 tons of ore were mined and shipped to the United States for treatment there.

(b) Tailings only.

Table 245.—Production of Diatomite in Canada, 1896-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1896.....	644	9,960	1907.....	30	225	1918.....	500	12,500
1897.....	15	150	1908.....	30	195	1919.....	565	11,300
1898.....	1,017	16,660	1909.....			1920.....	260	8,600
1899.....	1,000	15,000	1910.....	22	134			
1900.....	336	1,950	1911.....	20	122	1921.....	341	11,268
1901.....	850	15,300	1912.....	38	230	1922.....	219	5,781
1902.....	1,052	16,470	1913.....	620	12,138	1923.....	130	3,250
1903.....	835	16,700	1914.....	650	13,000	1924.....	33	838
1904.....	320	6,400	1915.....	317	12,119	1925-1926.....		
1905.....	300	3,600	1916.....	620	12,139	1927.....	266	6,650
1906.....			1917.....	600	18,000	1928.....	368	8,960
						Total.....	11,998	239,639

Table 246.—Production of Grindstones in Canada, by Provinces, 1886-1928

Year	Nova Scotia		New Brunswick		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1886.....	1,765	24,050	2,255	22,495	4,020	46,545
1887.....	1,710	25,020	3,582	38,988	5,292	64,008
1888.....	1,971	20,400	3,793	30,729	5,764	51,129
1889.....	712	7,128	2,692	23,735	3,404	30,863
1890.....	850	8,536	4,034	33,804	4,884	42,340
1891.....						
1892.....	1,980	19,800	2,499	22,787	4,479	42,587
1893.....	2,462	27,610	2,660	22,226	5,122	49,836
1894.....	2,112	21,000	2,368	15,979	4,480	36,979
1895.....	1,543	15,217	2,124	16,000	3,667	31,217
1896.....	1,400	14,000	1,995	16,652	3,395	30,652
1897.....						
1898.....	1,450	14,500	2,113	17,460	3,563	31,960
1899.....	1,407	17,500	3,065	23,240	4,472	40,740
1900.....	1,422	12,350	3,313	28,240	4,735	40,590
1901.....	1,377	10,300	2,735	24,965	4,112	35,265
1902.....	1,421	12,600	3,758	34,690	5,179	47,290
1903.....						
1904.....	358	3,200	3,676	34,075	4,034	37,275
1905.....	1,074	8,118	3,309	31,900	4,383	40,018
1906.....	1,337	9,562	4,086	36,900	5,423	46,462
1907.....	1,029	7,332	3,480	33,490	4,509	40,822
1908.....	1,020	10,200	4,440	49,700	5,460	59,900
1909.....						
1910.....	1,023	9,680	4,282	48,634	5,305	58,314
1911.....	551	4,480	4,833	54,396	5,384	58,876
1912.....	473	4,803	3,185	37,250	3,658	42,053
1913.....	312	3,204	3,690	43,170	4,002	46,374
1914.....	387	3,496	3,400	38,000	3,787	41,496
1915.....						
1916.....	380	3,382	3,952	43,450	4,332	46,832
1917.....	374	3,760	3,830	42,700	4,204	46,460
1918.....	350	4,900	3,658	40,400	4,008	45,300
1919.....	350	5,270	3,433	43,577	3,783	48,847
1920.....	285	5,300	1,994	26,667	2,279	31,967
1921.....						
1922.....	273	5,800	2,959	44,175	3,232	49,975
1923.....	375	9,875	1,794	28,827	2,169	38,702
1924.....	256	8,000	2,550	62,745	2,806	70,745
1925.....	283	9,000	1,648	47,344	1,931	56,344
1926.....	211	8,440	2,051	65,679	2,262	71,119
1927.....						
1928.....	183	6,990	881	33,647	1,064	40,637
	102	3,692	735	26,600	837	30,292
	254	7,906	1,463	49,577	1,717	51,483
	338	12,525	1,693	56,586	2,031	69,111
	439	16,723	1,296	45,061	1,735	61,784
1926.....						
1927.....	311	15,136	1,202	43,850	1,513	58,986
1928.....	11	220	1,306	47,255	1,317	47,475
			1,250	45,901	1,250	45,901
Total.....	35,921	441,005	119,062	1,567,546	154,983	2,008,551

Table 247.—Production of Pulpstones, Sharpening Stones, and Polishing Grit in Canada, 1892-1928

Year	Pulpstones		Sharpening stones		Polishing grit	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1892.....	60	900			101	450
1893.....	120	1,400				
1894.....	90	1,500				
1895.....	80	1,280				
1896.....	60	900			90	450
1897.....	100	1,600				
1898.....	200	3,200	33	985		
1899.....	375	7,000	24	1,000		
1900.....	360	6,160				
1901.....	547	8,415				
1902.....	250	4,100				
1903.....	115	1,840				
1904.....	140	1,960				
1905.....	68	1,875	12	600		
1906.....	40	600	18	900		
1907.....			30	1,500		
1908.....	158	4,725	27	1,350		
1909.....	240	6,640	33	1,650		
1910.....	125	3,700	36	1,800	25	200
1911.....	160	3,960	54	2,000	20	150
1912.....	125	4,000	38	1,300	45	330
1913.....	100	3,400	74	2,425	20	200
1914.....	40	4,000	115	1,254	38	403
1915.....			281	3,615	20	186
1916.....			224	2,614	22	193
1917.....	47	2,750	307	4,302		
1918.....	180	8,400	56	3,500	30	360
1919.....	14	420	45	3,392	30	360
1920.....	125	10,000	56	3,987	1	30
1921.....	200	22,000	17	1,430		
1922.....	150	12,000	18	1,450		
1923.....	260	25,100	35	3,500		
1924.....	624	58,113	36	3,600		
1925.....	781	57,781	46	4,600		
1926.....	1,155	89,541	27	2,700		
1927.....	911	75,242	23	2,300		
1928.....	581	52,659	24	2,400		
Total.....	8,581	487,161	1,689	60,154	442	3,312

Table 248.—Production of Grindstones, Pulpstones and Scythestones in Canada, by Provinces, 1926-1928

Province	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Nova Scotia.....	311	15,136	11	220		
New Brunswick.....	1,684	90,975	1,860	97,197	1,609	80,451
British Columbia.....	700	45,116	380	27,600	246	20,509
Total.....	2,695	151,227	2,251	125,017	1,855	100,960

Table 249.—Imports into Canada and Exports of Abrasives, 1926-1928

Item	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
IMPORTS—						
Abrasives—						
Artificial abrasives in bulk, crushed or ground, when imported for use in the manufacture of abrasive wheels and polishing composition.....		230,933		216,174		244,771
Carborundum wheels or stones not further manufactured than moulded and burned.....		158,448		131,428		222,386
Diamond dust or bort, and black diamonds for borers.....		963,141		1,396,122		2,281,249
Diatomaceous earth or infusorial earth (Kieselguhr) ground or unground (from April 1, 1928).....cwt.					5,354	9,594
Emery in bulk, crushed or ground.....		53,384		46,649		53,289
Emery wheels and carborundum wheels, n.o.p.....		77,331		56,916		109,185
Emery or carborundum, manufactures of, including carborundum stones, n.o.p.....		67,710		76,987		83,942
Grindstones, not mounted, and not less than 36 inches in diameter.....		791,412		815,257		612,792
Grindstones, n.o.p.....		36,838		96,451		40,598
Pumice and pumice stone, lava and calcareous tufa, not further manufactured than ground.....		32,005		35,211		48,062
Sand paper, glass, flint and emery paper or emery cloth.....		344,987		348,652		423,357
Iron sand or globules for polishing and sawing.....		17,464		12,052		18,110
Burrstones in blocks, rough or unmanufactured, not bound up or prepared for binding into mill-stones..... No.	3	450	3	450	119	925
Total.....		2,774,103		3,232,349		4,148,260
EXPORTS—						
Grindstones, manufactured.....		75,374		50,866		28,747
Abrasives—						
Natural, n.o.p.....cwt.	860	860	5,516	6,426	5,871	7,071
Artificial, crude, including carborundum.....cwt.	1,055,592	2,908,320	1,000,321	2,645,347	1,235,302	3,295,460
Artificial, made up into wheels, stones, etc.....		45,802		38,463		63,745
Total.....		3,030,356		2,741,102		3,395,023

(2) Abrasives, artificial and abrasive products

Manufactures of artificial abrasives and abrasive products in Canada amounted in value to \$7,122,588 in 1928. This was an increase of 16 per cent over the corresponding selling value for 1927. The principal products were fused alumina, 39,413 tons worth \$3,786,113; crude silicon carbide, 19,008 tons valued at \$2,098,199; and abrasive wheels valued at \$847,489. Other products were ferrosilicon, abrasive cloth and paper, firesand and sharpening stones.

For 1928, reports were received from 12 plants of which 11 were in Ontario and 1 in Quebec. Capital employed amounted to \$7,317,105 distributed as follows: cost of lands, buildings, equipment, etc., \$3,793,462; supplies and stock on hand, \$884,250, and cash, trading and operating accounts and bills receivable, \$2,639,393. The average number of employees was 691 and salaries and wages for the year totalled \$1,048,521. Materials used in manufacturing cost \$2,169,428 at the works, and the value added by manufacturing processes was \$4,953,160.

ASBESTOS

Asbestos was discovered in the Des Plantes river region, between St. Joseph and St. Francis villages, Quebec, about 1862. Exploitation of these deposits was found however, to be unprofitable owing to their limited character.

The next discovery of asbestos was made in the district of Thetford and Coleraine in 1877. In the following year mining was commenced on a small scale and some fifty tons were produced. The fibre produced was excellent but it was difficult to find a market.

In the course of the next twelve years developments in the industry were rapid. Seven quarries were in operation in 1885 and the exports during that year totalled 2,440 tons. First quality asbestos sold for \$80 per ton; however, a gradual increase in price was recorded and in 1900 when the total production was 29,141 tons this grade brought \$300 per ton. Production in 1910 advanced to 102,215 tons; employees numbered 3,693 with total wages of \$1,528,544. In 1920, there were 18 mines in operation, the quantity sold was 199,573 tons valued at \$14,792,201, employees totalled 3,572 and wages paid were \$4,765,305.

Canada is the world's leading producer of asbestos. In 1928 the Canadian production accounted for 69.4 per cent of the total world's output. Mines in Rhodesia, the Union of South Africa, Russia and Cyprus were also producers of considerable tonnages of asbestos in 1928.

Canadian shipments during the year totalled 273,033 tons valued at \$11,238,360 as against 274,778 tons at \$10,621,013 shipped in 1927. The average value received by the operators in 1928 was \$41.16 per ton as compared with \$38.65 per ton in the previous year. Asbestos rock mined during 1928 amounted to 5,171,060 tons of which quantity 4,118,044 tons were milled.

Exports of asbestos (including sand and waste) in 1928 amounted to 264,921 tons, consisting of 8,850 tons to Great Britain; 207,182 tons to the United States, 17,049 tons to Germany and smaller tonnages to Australia, Belgium, Denmark, France, Italy, Japan, Mexico, the Netherlands, New Zealand and Spain.

Ten plants in Canada manufacture asbestos products including: asbestos paper and mill board; asbestos roofing of all kinds; asbestos rigid shingles; asbestos building materials; asbestos cellular, and sponge-felted pipe insulation; insulating sheets and blocks; asbestos brake linings and clutch facings (woven on special looms); and asbestos packings for steam, oil and hydraulic operations. In 1928 production from these plants was valued at \$2,050,432.

Table 250.—Production of Asbestos in Canada, 1880-1928

Year	Short tons	Value	Year	Short tons	Value	Year	Short tons	Value
		\$			\$			\$
1880*.....	380	24,700	1897.....	30,442	445,368	1914.....	117,573	2,909,806
1881*.....	540	35,100	1898.....	23,785	491,197	1915.....	136,842	3,574,985
1882*.....	810	52,650	1899.....	25,536	485,849	1916.....	154,149	5,228,869
1883*.....	955	68,750				1917.....	153,781	7,230,383
1884*.....	1,141	75,097	1900.....	29,141	748,431	1918.....	158,259	8,970,797
			1901.....	40,217	1,259,759	1919.....	159,236	10,975,369
1885*.....	2,440	142,441	1902.....	40,416	1,148,319			
1886*.....	3,458	206,251	1903.....	41,677	929,757	1920.....	199,573	14,792,201
1887.....	4,619	226,976	1904.....	48,465	1,226,352	1921.....	92,761	4,906,230
1888.....	4,404	255,007				1922.....	163,706	5,552,723
1889.....	6,113	426,554	1905.....	68,263	1,503,259	1923.....	231,482	7,522,506
			1906.....	82,185	2,060,143	1924.....	225,744	6,710,830
1890.....	9,860	1,260,240	1907.....	90,426	2,505,042			
1891.....	9,279	999,878	1908.....	90,773	2,573,335	1925.....	273,524	8,977,546
1892.....	6,082	390,462	1909.....	87,300	2,301,775	1926.....	279,403	10,099,423
1893.....	6,331	310,156				1927.....	274,778	10,621,013
1894.....	7,630	420,825	1910.....	102,215	2,573,603	1928.....	273,033	11,238,360
			1911.....	127,414	2,943,108			
1895.....	8,756	368,175	1912.....	136,301	3,137,279			
1896.....	12,250	429,856	1913.....	161,086	3,849,925	Total.....	4,204,534	155,186,660

*Exports—

Table 251.—Mill Output and Shipments of Canadian Asbestos, 1927 and 1928

Classification	1927				1928			
	Total output	Sold or shipped			Total output	Sold or shipped		
		Quantity	Total sales value at mill	Average value per ton		Quantity	Total sales value at mill	Average value per ton
	Tons	Tons	\$	\$	Tons	Tons	\$	\$
Crude No. 1.....	527	1,107	468,980	423.65	706	893	477,640	534.87
Crude No. 2.....	2,855	3,014	752,277	249.59	2,784	2,757	818,174	296.76
Other crudes.....	370	667	151,231	226.73	507	516	65,868	127.65
Spinning stocks.....	12,273	14,348	1,855,425	129.32	14,051	13,570	2,017,884	148.70
Shingle stocks.....	45,784	44,573	2,889,124	64.81	41,975	34,961	2,580,160	73.80
Mill board and paper stocks.....	59,490	60,396	2,284,021	37.82	71,141	78,443	3,038,227	38.73
Fillers, floats and other short fibres.....	148,430	150,673	2,219,955	14.73	142,701	141,893	2,240,407	15.79
Total.....	269,709	274,778	10,621,013	38.65	273,865	273,033	11,233,360	41.16
Sand and gravel*.....	20,280	20,280	12,407	0.61	23,441	22,787	13,469	0.59

*This production has been included under the "Sand and Gravel Industry."

Table 252.—Imports of Asbestos into Canada, 1926-1928

Item	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Asbestos in any form other than crude, and all manufactures of, n.o.p.....		472,513		562,794		727,843
Asbestos packing.....	93	93,122	114	109,088	101	108,044
Total.....		565,635		671,882		835,887

Table 253.—Exports of Canadian Asbestos by Countries of Destination, 1926-1928

Commodity and Destination	1926.		1927.		1928.	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
ASBESTOS—						
Great Britain.....	7,710	575,866	11,673	818,858	6,886	547,250
United States.....	92,897	5,295,168	75,930	4,706,247	80,765	5,157,955
Australia.....	1,605	116,250	1,697	119,965	1,390	104,275
Belgium.....	10,033	628,981	8,068	540,655	3,841	309,149
France.....	6,860	481,145	5,486	409,840	7,012	505,825
Germany.....	12,537	900,104	16,317	1,223,768	13,589	1,153,177
Italy.....	3,671	242,482	3,687	246,633	3,431	296,148
Japan.....	4,518	250,714	7,553	402,075	9,165	507,758
Netherlands.....	1,723	167,050	2,533	209,290	2,464	168,289
Spain.....			22	1,210	431	33,055
Other countries.....	206	12,050	259	18,835	218	19,677
Total.....	141,760	8,669,810	133,225	8,697,376	129,192	8,802,558
SAND AND WASTE—						
Great Britain.....	1,594	35,767	2,823	65,479	1,964	40,727
United States.....	131,437	1,889,003	120,378	1,830,728	126,417	1,960,491
Germany.....	1,656	84,718	3,512	73,173	3,460	84,950
Netherlands.....	720	15,850	2,203	46,939	1,988	48,900
Other countries.....	824	17,142	1,149	21,616	1,900	42,661
Total.....	136,231	1,992,480	130,065	2,637,935	135,729	2,177,729
ASBESTOS MANUFACTURES INCLUDING ASBESTOS ROOFING—						
Great Britain.....		4,793		7,479		7,738
United States.....		19,118		18,599		22,711
British South Africa.....				831		
Newfoundland.....		6,371		5,383		5,765
New Zealand.....		1,247		859		1,571
Other countries.....		11,482		33,183		28,110
Total.....		43,011		66,334		65,895

Table 254.—Monthly Average Prices of Asbestos by Grades, 1927 and 1928

(Per short ton)

(Computed from quotations in the *Engineering and Mining Journal*)

Month	Crude No. 1	Crude No. 2	Spinning fibres	Magnesia and compressed sheet fibres	Shingle stock	Paper stock	Cement stock	Short fibres	Floats
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1927									
January.....	525	300	190	137	80	43	25	15	15
February.....	525	325	200	137	80	43	25	15	15
March.....	525	325	200	137	80	43	25	15	15
April.....	525	325	200	145	75	43	25	15	15
May.....	525	325	200	145	75	43	25	15	15
June.....	525	325	200	145	75	43	25	15	15
July.....	525	325	200	145	75	43	25	15	15
August.....	525	325	200	145	75	43	25	15	15
September.....	575	375	225	175	93	45	25	15	15
October.....	575	375	225	160	93	45	25	15	15
November.....	575	375	225	160	93	45	25	15	15
December.....	650	450	225	168	100	48	25	15	15
Average.....	548	346	208	150	83	44	25	15	15
1928									
January.....	650	450	212	168	100	48	25	15	15
February.....	650	450	212	168	90	48	25	15	15
March.....	650	450	212	170	90	48	25	15	15
April.....	650	400	212	168	90	48	25	15	15
May.....	625	388	208	168	85	48	25	15	15
June.....	625	388	208	168	85	48	25	15	15
July.....	625	388	208	168	85	48	25	15	15
August.....	625	388	208	168	85	48	25	15	15
September.....	625	388	208	168	85	48	25	15	15
October.....	625	388	208	168	85	48	25	15	15
November.....	625	388	208	168	85	48	25	15	15
December.....	625	388	208	168	85	48	25	15	15
Average.....	633	406	209	165	88	48	25	15	15

Table 255.—Capital Employed in the Asbestos Industry in Canada, 1926-1928

	1926	1927	1928
	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—			
Cost of lands, buildings, machinery and tools.....	30,343,961	30,837,295	32,262,729
Cost of supplies and stocks on hand.....	2,117,598	1,686,084	1,850,799
Cash, trading and operating accounts and bills receivable.....	2,443,537	2,793,442	1,591,684
Total.....	34,905,096	35,316,821	35,705,212

Table 256.—Employees, Salaries and Wages in the Asbestos Industry in Canada, 1927 and 1928

	1927				1928			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried Employees.....	129	12	141	349,434	128	19	147	372,070
Wage-Earners—								
Mine.....	1,707		1,707		1,739		1,739	
Mill.....	1,128		1,128		1,284		1,284	
Total.....	2,835		2,835	3,411,758	3,023		3,023	3,617,574
Grand total.....	2,964	12	2,976	3,761,192	3,151	19	3,170	3,989,644

Table 257.—Wage-Earners in the Asbestos Industry in Canada by Months, 1927 and 1928

Month	1927		1928		Month	1927		1928	
	Mine	Mill	Mine	Mill		Mine	Mill	Mine	Mill
January.....	1,530	957	1,514	1,219	July.....	1,635	1,104	1,670	1,306
February.....	1,587	934	1,553	1,165	August.....	1,751	1,200	1,779	1,352
March.....	1,663	1,026	1,595	1,170	September.....	1,835	1,203	1,886	1,435
April.....	1,601	1,052	1,578	1,171	October.....	1,800	1,230	1,924	1,409
May.....	1,698	1,123	1,652	1,199	November.....	1,778	1,217	1,914	1,388
June.....	1,728	1,133	1,733	1,258	December.....	1,772	1,208	1,856	1,308

Table 258.—*World Production of Asbestos, 1913 and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
Canada ¹	118,361	201,557	259,275	249,467	245,337	243,780
Southern Rhodesia ²	259	23,340	30,669	29,771	29,621	35,679
Union of South Africa ²	859	6,459	9,078	13,884	21,004	24,197
Australia ²		74	51	109	11	5
Cyprus ² (exports).....	1,168	3,903	3,221	6,313	11,380	16,287
India ²		125	16	80	68	157
Total.....	120,647	235,458	302,310	299,624	307,421	320,105
FOREIGN COUNTRIES						
China ²		125	213	(a)	(a)	(a)
Finland ²		1,207	1,700	2,133	2,385	2,241
Italy ²		2,125	2,071	2,500	4,470	(a)
Russia ²	17,218	8,197	10,000	18,044	20,822	26,000
United States ³	982	268	1,123	1,213	2,662	1,999
France ²		868	654	650	(a)	(a)
Japan ²		277	1,155	1,000	1,000	1,000
Total.....	18,372	13,067	16,916	25,540	31,339	31,240
Grand total.....	139,019	248,525	319,226	325,164	338,760	351,345

*Source—

¹Dominion Bureau of Statistics, Canada.²Imperial Institute publications.³Mineral Resources of the United States.

(a) Data not available.

FELDSPAR

The first record of production in the feldspar industry in Canada dates back to about the year 1890. The production during that year was approximately 700 tons and since that date an increase has been recorded until in 1924 the maximum output for the industry, namely, 44,804 tons, was produced.

Feldspar production in Canada during 1928 increased 7 per cent in quantity and 10 per cent in value over the totals for 1927. The 1928 production was 31,897 tons valued at \$284,942 as compared with shipments of 29,849 tons worth \$259,151 in the previous year. The tonnage of crude feldspar sold or used by producers in the United States during 1928 showed a somewhat similar trend; a 4 per cent increase being recorded.

All of the feldspar mined in Canada is of the potash variety known as orthoclase or microcline. Soda feldspar (albite) is known to occur, but there is little demand for this variety and none is mined.

The principal producing localities in 1928 were the Hybla, Perth, and Verona areas, in Ontario, and Aylwin township and the Buckingham area in Quebec. The last named came to the fore in 1921, when development work proved up several bodies of exceptionally good feldspar and resulted in a production of 10,000 tons from one quarry alone in that year. The Richardson mine, near Verona, Ontario, formerly an important producer but idle for many years, was re-opened during 1928.

The Kingston plant for the fine grinding of feldspar was in operation during 1928.

Exports of Canadian crude feldspar in 1928 totalled 28,101 tons appraised at \$230,945. These exports were principally to the United States. Imports of feldspar into Canada increased slightly, amounting to 3,171 tons worth \$53,818 as against 3,040 at \$50,875 imported in 1927.

Table 259.—Production of Feldspar in Canada, by Provinces, 1890-1928

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1890.....	700	3,500			700	3,500
1891.....	685	3,425			685	3,425
1892.....	175	525			175	525
1893.....	575	4,525			575	4,525
1894.....						
1895.....					1,018	*2,545
1896.....	972	2,583			972	2,583
1897.....	1,400	3,290			1,400	3,290
1898.....	2,500	6,250			2,500	6,250
1899.....	3,000	6,000			3,000	6,000
1900.....	155	542	163	570	318	1,112
1901.....	534	1,068	4,816	9,632	5,350	10,700
1902.....			7,576	15,152	7,576	15,152
1903.....	18	32	13,910	18,034	13,928	18,966
1904.....			11,083	22,166	11,083	22,166
1905.....			11,700	23,400	11,700	23,400
1906.....			16,948	40,890	16,948	40,890
1907.....			12,584	29,819	12,584	29,819
1908.....			7,877	21,099	7,877	21,099
1909.....	97	1,719	12,686	38,664	12,783	40,383
1910.....	90	1,800	15,719	45,867	15,809	47,667
1911.....	17	255	17,706	51,684	17,723	51,939
1912.....	100	2,000	13,633	28,916	13,733	30,916
1913.....	74	1,554	16,716	59,241	16,790	60,795
1914.....	98	2,156	17,962	68,668	18,060	70,824
1915.....	572	2,005	13,987	55,796	14,559	57,801
1916.....	4,610	18,075	14,878	53,332	19,488	71,407
1917.....	1,188	8,204	18,274	81,622	19,462	89,826
1918.....	191	4,279	18,591	108,449	18,782	112,728
1919.....	925	13,073	13,754	73,158	14,679	86,231
1920.....	649	10,052	37,224	270,843	37,873	280,895
1921.....	9,737	80,180	20,115	150,457	29,868	230,754
1922.....	12,472	127,826	15,255	120,576	27,727	248,402
1923.....	12,026	102,779	17,199	134,822	29,225	237,601
1924.....	16,147	142,118	28,657	216,422	44,804	358,540
1925.....	11,287	94,730	17,394	141,059	28,681	235,789
1926.....	13,168	111,136	22,783	199,102	35,951	310,238
1927.....	12,730	104,618	17,119	154,533	29,849	259,151
1928.....	12,943	104,789	18,954	180,153	31,897	284,942
Total.....	119,835	965,088	455,263	2,415,026	576,132	3,382,776

*Exports.

†Includes Nova Scotia production—16 tons valued at \$117.

Table 260.—Production in Canada, Imports and Exports of Feldspar, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	13,168	111,136	12,730	104,618	12,943	104,789
Ontario.....	22,783	199,102	17,119	154,533	18,954	180,153
Total.....	35,951	310,238	29,849	259,151	31,897	284,942
IMPORTS.....	2,441	45,975	3,040	50,875	3,171	53,818
EXPORTS.....	33,016	251,551	28,648	225,955	28,101	230,945

Table 261.—Capital Employed in the Feldspar Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	245,888	146,489
Cost of supplies and stocks on hand.....	29,801	18,838
Cash, trading and operating accounts and bills receivable.....	47,289	72,073
Total.....	322,978	273,400

Table 262.—Employees, Salaries and Wages in the Feldspar Industry in Canada, 1927 and 1928

	1927				1928			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	7		7	11,643	7	1	8	14,172
Wage-earners.....	227		227	139,910	215		215	130,488
Total.....	234		234	151,553	222	1	223	144,660

Table 263.—Wage-Earners in the Feldspar Industry in Canada, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	151	144	July.....	213	205
February.....	152	152	August.....	209	198
March.....	163	122	September.....	211	207
April.....	143	109	October.....	199	188
May.....	215	133	November.....	182	189
June.....	209	176	December.....	180	184

Table 264.—*World Production of Feldspar, 1913 and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
United Kingdom (b).....	66,626	55,756	57,379	47,769	63,612	61,579
Canada.....	14,991	40,003	25,608	32,099	26,651	28,481
Australia.....		15	32	122	108	161
Union of South Africa.....				99	29	29
Total.....	81,617	95,774	83,019	80,089	90,400	90,250
FOREIGN COUNTRIES						
Czechoslovakia (estimated).....	(a)	(a)	(a)	30,000	30,000	30,000
Finland.....		659	788	800	643	700
France.....				18,951	(a)	(a)
Germany (Bavaria).....	(a)	32,605	10,093	6,553	7,204	(a)
Italy.....		3,200	2,500	5,785	3,990	(a)
Japan.....	(a)	23,050	18,743	(a)	(a)	(a)
Norway (Exports).....	40,186	20,530	26,355	20,181	27,213	23,894
Rumania.....				1,662	1,912	2,790
Russia (fiscal years Sept. 30th).....	(a)	(a)	8,477	20,629	19,019	(a)
Sweden.....	37,269	18,999	26,321	33,434	30,152	39,290
United States.....	107,996	204,772	185,706	209,989	202,497	210,811
Total.....	185,451	303,815	278,983	347,984	322,630	307,485
Grand total.....	267,068	399,589	362,002	428,073	413,030	397,735

* Source—Imperial Institute publications.

(a) Data not available.

(b) Including China Stone.

GRAPHITE

The first operations in the graphite industry in Canada were carried on in the province of Quebec in 1846, when a deposit of crystalline graphite was worked in Grenville township. During 1869 an estimated value of \$72,000 was placed on shipments of graphite from New Brunswick and Quebec. Ten years later exports from Canada were valued at \$1,167. During the three-year period 1869-1871, a property in Buckingham township, Quebec was operated with an average production of 450 tons; employment was furnished 18 men during this period. From 1888 to 1899, operations were carried on intermittently in Buckingham township, however, from that date to 1906 little work was done on these deposits. In 1916, mills at Buckingham and St. Remi d'Amherst, shipped 479 tons.

Mining and milling of graphite in Ontario had its inception in 1870 when the Port Elmsley deposit was opened up and the Oliver's Ferry refining plant was constructed. A deposit in Bedford township was operated prior to 1890 and a small quantity of crystalline graphite was produced. In 1896 another producer commenced operations, namely, the Black Donald Company. This company's deposit is located near Calabogie in Renfrew county and is the largest and richest body of graphite known in North America. Operations have been practically continuous since the opening up of this property. The graphite is shipped as refined product, the higher grades which are used in lubricating compounds, being 90 to 99 per cent pure. These products are used principally in lubricants, foundry facings, stove polishes and in the manufacture of paints for iron and steel structural work. In 1919 the N. A. Timmins deposit in North Burgess township was opened up.

The demand for Canadian graphite during the war years had its peak in 1916 and the production in that year amounted to 3,955 tons valued at \$325,362. The six plants in operation employed 344 men, whose wages totalled \$191,876. Although the 1917 tonnage was 241 tons less than that of the preceding year, the value received by the operators was considerably higher, the total being, \$402,892. No. 1 flake graphite sold for an average of \$293.80 per ton in 1917; No. 2 flake, \$153.26 per ton; and amorphous and dust, \$57.30 a ton.

During 1928, shipments of graphite from Canadian deposits reached a total of 1,097 tons valued at \$57,041, consisting of 1,047 tons from Ontario and 50 tons from Quebec.

Customs' records for 1928 show exports of graphite, crude or refined, amounting to 1,053 tons appraised at \$45,384.

Table 265.—Production of Graphite in Canada, by Provinces, 1886-1928

Year	New Brunswick		Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
1886.....	500	4,000					500	4,000
1887.....	300	2,400					300	2,400
1888.....	150	1,200					150	1,200
1889.....	200	1,600	42	1,560			242	3,160
1890.....	150	1,200	25	4,000			175	5,200
1891.....	260	1,560					260	1,560
1892.....			167	3,763			167	3,763
1893.....								
1894.....			5	400			5	400
1895.....	150	900	70	5,250			220	6,150
1896.....	45	315	94	9,140	650	13,000	789	22,455
1897.....	89	890	247	12,350	100	3,000	436	16,240
1898.....	260	2,600	100	5,098	300	6,000	660	13,698
1899.....			90	8,000	1,220	16,179	1,310	24,179
1900.....	120	1,440	302	5,600	1,500	24,000	1,922	31,040
1901.....	240	2,880	220	4,400	1,750	31,500	2,210	38,780
1902.....	200	2,400	100	10,000	795	15,900	1,095	28,300
1903.....					728	23,745	728	23,745
1904.....	60	480	25	2,300	367	8,980	452	11,760
1905.....	60	480			481	16,255	541	16,735
1906.....			125	8,300	262	10,000	387	18,300
1907.....			120	5,000	459	11,000	579	16,000
1908.....	40	360	1	165	210	5,040	251	5,565
1909.....			134	10,176	730	37,624	864	47,800
1910.....			155	16,000	1,237	58,087	1,392	74,087
1911.....			374	33,084	895	36,492	1,269	69,576
1912.....			604	50,680	1,456	66,442	2,060	117,122
1913.....			103	9,620	2,059	80,662	2,162	90,282
1914.....			261	18,886	1,386	88,317	1,647	107,203
1915.....			75	5,431	2,560	118,792	2,635	124,223
1916.....			479	75,776	3,476	249,586	3,955	325,362
1917.....			541	106,305	3,173	296,587	3,714	402,892
1918.....			180	40,018	2,934	208,852	3,114	248,870
1919.....			20	400	1,340	99,821	1,360	100,221
1920.....			233	31,913	1,957	133,704	2,190	165,617
1921.....			38	2,423	899	63,439	937	65,862
1922.....			24	1,500	573	29,853	597	31,353
1923.....			45	2,316	1,068	65,557	1,113	67,873
1924.....			46	3,275	1,288	72,842	1,334	76,117
1925.....			359	30,900	2,210	127,863	2,569	158,763
1926.....			326	29,516	2,401	165,344	2,727	194,860
1927.....			34	2,043	1,795	109,613	1,829	111,656
1928.....			50	4,668	1,047	52,373	1,097	57,041
Total.....	2,824	24,705	5,814	560,256	43,205	2,346,449	51,944	2,931,410

Table 266.—Production in Canada, Imports and Exports of Graphite, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Ore milled.....	9,006		7,743		392	
Production.....	2,727	194,860	1,829	111,656	1,097	57,041
IMPORTS—						
Crucibles, plumbago.....		60,782		60,783		55,488
Plumbago, not ground or otherwise manufactured.....		3,836		1,457		4,023
Plumbago, ground and manufactures of, n.o.p.....		57,302		60,897		68,515
EXPORTS—						
Graphite or plumbago, crude or refined.....	2,564	180,851	1,699	102,476	1,053	45,384

Table 267.—*World Production of Graphite, 1913 and 1924-1928

(Long tons)

	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
Canada.....	1,930	1,191	2,294	2,435	1,633	980
Australia.....		3			10	
Ceylon.....	28,540	9,651	15,426	11,623	12,884	14,347
Tanganyika Territory.....	-	-	-	-	-	6
Union of South Africa.....	35	49	47	46	57	50
Total.....	30,505	10,894	17,767	14,104	14,584	15,383
FOREIGN COUNTRIES						
Austria.....	48,742	9,370	12,868	14,523	17,773	23,843
Czechoslovakia.....		11,743	18,169	30,323	40,464	31,821
France.....	1,175	506	1,121	935	(a)	(a)
Germany.....	11,900	9,917	16,582	14,078	17,492	17,187
Italy.....	10,966	7,616	9,777	9,453	8,262	6,919
Norway.....	295					
Russia (years ended Sept. 30).....	(a)	(a)	1,277	6,304	6,749	1,867
Spain.....			1,914	593	346	(a)
Sweden.....	87					
Greenland.....		52			(a)	
Indo-China (French).....		2,228	218	801	405	
Japan.....	654	755	994	491	623	435
Korea.....	12,080	14,708	13,852	15,504	17,600	21,000
Madagascar.....	6,212	12,837	12,796	15,651	14,526	13,678
Mexico.....	4,364	7,894	5,745	4,364	5,745	4,893
United States.....	4,263	4,438	4,165	4,884	4,649	5,010
Total.....	100,738	82,064	99,478	117,904	134,634	126,653
Grand total.....	131,243	92,958	117,245	132,005	149,218	142,036

*Source—Imperial Institute publications.

ARTIFICIAL GRAPHITE

Artificial graphite is manufactured in electric furnaces at Niagara Falls, Ontario, by the Acheson Graphite Company. The annual production over a period of fifteen years is shown in the following table:

Table 268.—Artificial Graphite made in Canada, 1914-1928

Year	Pounds	Year	Pounds	Year	Pounds
1914.....	1,234,239	1919.....	358,524	1924.....	816,455
1915.....	497,271	1920.....	207,180	1925.....	1,291,311
1916.....	525,048	1921.....	376,508	1926.....	1,246,291
1917.....	1,096,172	1922.....	724,524	1927.....	1,187,011
1918.....	1,808,698	1923.....	1,554,376	1928.....	1,662,000

GYPSUM

Canada ranks third among the world's producers of gypsum. In 1928 the shipments of gypsum from Canadian deposits totalled 1,246,368 tons valued at \$3,743,648 and set a new high record for the industry. Gypsum quarried during the year amounted to 1,311,642 tons of which quantity 226,997 tons or 17.3 per cent was calcined in Canada.

Quarries in Hants, Inverness and Victoria counties, Nova Scotia; Albert and Victoria counties, New Brunswick; near Paris, Ontario; Gypsumville, Manitoba; and at Falkland and Mayook, British Columbia, were worked during 1928. Approximately 95.7 per cent of the Nova Scotia production is shipped as crude gypsum to the United States. A plant at Windsor, N.S., ships hard wall and selenite plasters throughout the Maritime provinces and some as far west as Montreal. The plant at Iona, Nova Scotia produces wall plaster, stucco and dental plaster, with a market throughout the Maritime provinces, Quebec and Ontario, while some shipments have been made to the New York market, and tonnages have been shipped direct to New Zealand.

The New Brunswick output consists of very pure quality gypsum produced from the Hillsborough deposits; products made from this material consist of hard wall plaster, finishing plaster and dental plaster of different grades. A small production of land plaster was shipped from Plaster Rock during the year.

A most important development in the industry was the amalgamation of the Manitoba Gypsum Co. and the British Columbia Gypsum Co. with the Canada Gypsum and Alabastine Co., Ltd. This company now operates gypsum plants in Montreal, P.Q.; Caledonia and Lythmore, Ont.; Winnipeg, Man.; and Port Mann, B.C.

Crude gypsum exported from Canadian quarries in 1928 amounted to 824,536 tons; this tonnage was shipped to the United States. Ground gypsum and prepared wall plaster exported during the year totalled 8,232 tons. The United States, New Zealand, Australia and Newfoundland were the principal importers of these materials from Canada.

Table 269.—Annual Production of Gypsum in Canada, by Provinces, 1874-1928

Year	Nova Scotia		New Brunswick		Ontario		Manitoba		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$		\$		\$
1874*	67,830	68,164									67,830	68,164
1875	86,065	86,193	5,420	5,420							91,485	91,613
1876	87,720	87,590	4,925	6,616	120	180					92,765	94,386
1877	106,950	93,867	5,030	5,030							111,980	98,897
1878	88,631	76,695	16,335	16,435	489	675					106,455	93,805
1879	95,623	71,353	8,791	8,791	579	720					104,993	80,864
1880	125,685	111,833	10,375	10,987	875	1,240					136,935	124,060
1881	110,303	100,284	10,310	15,025	657	1,040					121,270	116,349
1882	133,426	121,070	15,597	24,581	1,249	1,946					150,272	147,537
1883	145,448	132,534	20,242	35,557	462	837					166,152	169,228
1884	107,653	100,446	21,800	32,751	688	1,254					130,141	134,451
1885*	81,887	77,898	15,140	27,730	525	787					97,532	106,415
1886	123,793	118,110	32,421	48,632	5,826	12,000					162,000	178,742
1887	116,346	116,346	29,102	29,216	8,560	11,715					154,008	157,277
1888	124,818	120,429	44,369	48,764	6,700	10,200					175,887	179,393
1889	165,025	142,850	40,866	49,130	7,382	13,128					213,273	205,108
1890	181,285	154,972	39,024	30,986	6,200	8,075					226,509	194,633
1891	161,934	153,955	36,011	33,996	5,660	18,300					203,605	206,251
1892	197,019	170,021	39,709	65,707	4,320	5,399					241,048	241,127
1893	152,754	144,111	36,916	41,846	2,898	10,193					192,568	196,150
1894	168,300	147,644	52,963	48,200	2,369	6,187					223,631	202,631
1895	156,809	133,929	66,949	63,839	2,420	4,840					226,178	202,608
1896	136,590	111,251	67,137	59,024	3,305	7,789					207,032	178,061
1897	155,572	121,754	82,658	118,116	1,461	4,661					239,691	244,531
1898	132,086	106,610	86,083	121,704	1,087	4,201					219,256	232,515
1899	126,754	102,055	116,792	151,296	1,020	3,978					244,566	257,329
1900	138,712	108,828	112,294	145,850	1,095	4,231					252,101	259,009
1901	170,100	136,947	121,595	189,709	1,504	5,692	600	7,800			293,799	304,148
1902	206,087	181,425	124,041	170,153	1,917	7,699	1,554	20,202			333,599	379,479
1903	189,427	173,881	119,182	172,080	2,720	21,988	3,160	20,510			314,489	388,459
1904	181,580	153,600	120,991	187,524	2,390	18,350	4,000	14,000			345,961	373,474
1905	272,252	298,248	163,553	232,586	1,853	23,834	4,500	31,500			442,158	586,168
1906	333,312	345,414	131,246	250,960	1,964	24,420	2,500	22,500			469,022	643,294
1907	357,411	380,859	118,106	213,638	10,404	52,417					485,921	646,914
1908	234,455	230,433	81,620	191,312	10,389	42,456	14,500	111,500			340,964	575,701
1909	345,682	364,379	98,716	226,975	11,731	48,278	17,000	170,000			473,129	809,632
1910	400,455	458,638	90,236	213,579	15,055	67,229	19,500	195,000			525,246	934,446
1911	353,999	406,457	93,205	115,044	27,399	98,018	43,000	372,000	780	1,875	518,383	993,394
1912	376,082	481,493	82,757	185,821	53,119	176,056	66,500	481,250			578,458	1,324,620
1913	404,801	479,515	103,954	279,395	62,315	208,029	65,100	479,500	200	1,300	636,370	1,447,739
1914	303,155	368,931	79,083	200,680	81,219	204,033	53,423	382,563			516,880	1,156,207
1915	298,864	339,857	74,501	184,929	81,172	190,422	20,278	139,721			474,815	854,929
1916	238,212	278,160	39,546	153,064	36,668	116,086	28,489	191,283			342,915	738,593
1917	215,472	301,261	38,556	191,631	48,947	130,138	33,347	258,934	10	20	336,332	881,984
1918	49,365	115,976	27,225	214,114	38,214	151,564	37,483	341,352			152,287	823,006
1919	163,852	250,174	42,409	315,656	59,899	278,120	32,903	371,337			299,063	1,215,287
1920	260,661	573,752	49,405	428,183	74,707	404,162	44,371	487,894			429,144	1,893,991
1921	206,831	511,883	54,030	360,220	84,790	433,053	40,859	480,282	40	100	386,550	1,785,538
1922	332,404	580,148	82,462	517,668	110,227	621,668	34,072	440,914	100	500	559,265	2,160,898
1923	341,705	747,934	104,740	564,680	99,958	542,817	31,575	386,554	323	1,615	578,301	2,243,100
1924	441,752	915,845	86,738	476,804	88,121	467,097	29,375	348,212	30	150	646,016	2,208,108
1925	551,230	1,070,408	71,745	408,917	82,020	491,833	35,088	417,868	240	865	740,323	2,389,891
1926	678,107	1,187,918	56,456	468,411	89,987	496,059	35,172	461,461	20,916	156,964	883,728	2,770,813
1927	829,438	1,512,015	85,293	524,550	83,998	500,688	39,895	512,008	24,493	201,754	1,063,117	3,251,015
1928	1,013,257	1,850,243	75,033	501,252	85,811	553,271	51,285	609,039	20,982	229,843	1,246,368	3,743,648
Total	13,261,926	17,776,886	3,436,772	9,384,764	1,414,445	6,508,650	789,529	7,755,184	68,114	594,986	18,970,786	42,020,470

*1874 to 1885 inclusive, exports.

Table 270.—Summary of Statistics on Gypsum in Canada, 1926-1928

	1926.		1927.		1928.	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Crude gypsum mined.....	931,193		1,105,704			1,311,642
Crude gypsum calcined.....	161,841		196,232			226,997
PRODUCTION BY GRADES—						
Crude—						
Lump.....	151,906	225,749	225,264	371,488	43,224	80,467
Crushed.....	576,489	1,002,679	665,499	1,223,070	1,018,172	1,770,077
Fine ground.....	5,874	86,813	7,065	42,633	9,576	55,170
Calcined.....	149,459	1,505,572	165,289	1,613,824	175,396	1,837,934
Total.....	883,728	2,770,813	1,063,117	3,251,015	1,246,868	3,743,648
PRODUCTION BY PROVINCES—						
Nova Scotia.....	678,107	1,187,918	829,438	1,512,015	1,013,257	1,850,243
New Brunswick.....	59,546	468,411	85,293	524,550	75,033	501,252
Ontario.....	89,987	496,059	83,998	500,688	85,811	553,271
Manitoba.....	35,172	461,461	39,895	512,008	51,285	609,039
British Columbia.....	20,916	156,964	24,493	201,754	20,982	229,843
Total.....	883,728	2,770,813	1,063,117	3,251,015	1,246,868	3,743,648
IMPORTS—						
Gypsum, crude (sulphate of lime)*.....	933	32,442	1,092	42,741	1,097	40,312
Plaster of Paris, or gypsum ground not calcined.....	209	6,846	111	2,996	256	7,379
Plaster of Paris, or gypsum calcined and prepared wall plaster.....	5,156	79,853	7,016	101,823	10,563	142,550
Total.....	6,298	119,141	8,219	147,560	11,916	190,241
EXPORTS—						
Gypsum or plaster crude.....	668,064	1,069,123	588,808	959,858	824,536	1,240,987
Plaster of Paris, ground and prepared wall plaster.....	10,062	137,785	6,556	113,049	8,232	140,946
Total.....	678,126	1,206,908	595,364	1,072,907	832,768	1,381,933

* Consists of crown filler and anhydrous sulphate of lime.

Table 271.—Capital Employed in the Gypsum Industry in Canada by Provinces, 1927 and 1928

	1927			1928		
	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	3,747,108	3,787,921	7,535,029	4,440,028	2,019,119	6,459,147
Cost of all supplies and stocks on hand....	362,006	175,059	537,065	417,152	220,728	637,880
Cash, trading and operating accounts and bills receivable.....	237,210	746,320	983,530	76,399	861,893	938,292
Total.....	4,346,324	4,709,300	9,055,624	4,933,579	3,101,740	8,035,319

Table 272.—Employees, Salaries and Wages in the Gypsum Industry in Canada, 1927 and 1928

	1927				1928			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
Salaried employees.....	53	10	63	\$ 178,976	57	18	75	\$ 180,870
Wage-earners—								
Mine.....	973		973		733		733	
Mill.....	391		391		351		351	
Total.....	1,364		1,364	1,132,712	1,084		1,084	990,944
Grand total.....	1,417	10	1,427	1,311,688	1,141	18	1,159	1,171,814

Table 273.—Wage-Earners in the Gypsum Industry in Canada by Provinces, 1928

Month	Nova Scotia		New Brunswick, Ontario, Manitoba and British Columbia		Canada	
	Mine	Mill	Mine	Mill	Mine	Mill
January.....	301	62	156	202	457	264
February.....	193	45	141	190	334	235
March.....	246	55	153	202	399	257
April.....	471	131	152	214	623	345
May.....	598	105	223	235	821	340
June.....	662	102	234	220	896	322
July.....	626	105	243	256	869	361
August.....	625	110	214	259	839	369
September.....	605	107	225	243	830	350
October.....	612	163	227	242	839	405
November.....	542	241	182	228	724	469
December.....	363	326	142	233	505	559

Table 274.—*World Production of Gypsum 1913, and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
United Kingdom.....	285,338	371,703	414,529	465,191	506,350	634,645
Canada (shipments).....	568,188	576,800	661,003	789,043	949,211	1,112,829
Union of South Africa.....	108	9,073	7,123	(b) 11,029	(b) 15,187	14,637
Cyprus (shipments).....	3,714	14,296	24,193	17,677	15,139	(b) 11,426
Palestine.....					1,140	1,341
India.....	24,961	38,123	36,244	34,473	38,105	59,050
Australia.....	8,826	85,861	90,150	80,565	122,842	118,867
Total.....	891,135	1,065,856	1,233,242	1,397,978	1,647,974	1,952,795
FOREIGN COUNTRIES						
Austria (exports less imports).....		32,262	24,067	21,741	24,799	28,100
Estonia.....	(a)		3,821	4,751	11,979	7,856
France.....	1,698,633	2,289,443	2,293,000	2,412,900	(a)	(a)
Germany (Bavaria).....		42,635	57,352	44,556	58,779	(a)
Greece.....	2,194	21,850	9,898	9,158	1,982	
Italy (including alabaster).....		590,298	662,707	645,194	663,287	569,351
Jugoslavia (Serbia only).....				610	1,046	1,152
Rumania.....			24,556	33,447	7,724	14,167
Russia (years ended Sept. 30.).....		20,454	52,994	43,616	76,496	47,030
Spain (exports).....	(a)	(a)	166,353	303,295	278,532	(a)
Sweden.....	6,938	4,568	2,658	719,816	896,950	(a)
Algeria.....				135	88	49
United States.....		53,600	71,700	72,408	(a)	68,000
Argentina (exports).....	2,320,989	4,502,347	5,066,964	5,031,644	4,774,007	4,555,580
Chile.....	171	2,179	1,833	(a)		(a)
Peru.....	6,038	5,600	8,310	6,880	8,245	(a)
China (exports).....	(a)	(a)	14,413	11,521	8,891	(a)
Japan.....	4,970	5,042	6,984	3,721	2,431	3,214
Philippine Islands.....	(a)	42,400	152,736	260,803	74,306	(a)
				381	(a)	(a)
Total.....	4,039,933	7,612,678	8,620,646	9,626,977	6,890,542	5,294,499
Grand total.....	4,931,068	8,708,534	9,853,888	11,024,955	8,538,516	7,247,294

*Source—Imperial Institute publications.

(a) Data not available.

(b) Shipments.

IRON OXIDES

In 1851, an important deposit of ochre was worked at Pointe du Lac, St. Maurice county, Quebec, and shipments of dried ochre were made to the United States but subsequently this property was abandoned. Thirty-two years later the manufacture of dry ochre was commenced on a small scale in Uberville township on the Little Romaine river. This deposit was later abandoned but in 1916 it was re-opened and a small quantity of crude ochre was taken out for use as a pigment in the paper industry. A deposit was opened up at St. Malo, Champlain county, in 1885 and a calcining plant erected. Calcined ochre was shipped from this mill to Montreal where it was further prepared for use in the manufacture of paint.

Deposits of iron oxides in the Three Rivers district, Quebec, are important. The Canada Paint Company Limited, operates a large plant at Red Mill for calcining, washing and grinding pigments.

About 1½ miles east of Red Mill, the Champlain Oxide Company operated a calcining plant. No shipments have been made from this plant since 1923.

For a number of years Thos. H. Argall operated a calcining plant near the Champlain mill. Operations ceased, however, due to labour troubles and this producer opened up another deposit at Pointe-du-Lac from which crude iron oxides are shipped for use in the purifying of illuminating gas.

The Montmorency Paint Products Co., have operated a deposit at Beaupré, Pelletier township, Quebec for several years.

Prior to 1911 small quantities of ochre were produced intermittently from a deposit at Campbellville, Halton county, Ontario. No production has been recorded in this province since that date.

In 1921 a trial shipment of bog iron ore was made from Alta lake, British Columbia. The following year an experimental consignment was sent to Calgary by a small operator in the Windermere district, British Columbia. Shipments totalling 500 tons were made from these two deposits during 1923. There has been a small annual production during the past five years.

Iron oxides produced from Canadian deposits during 1928 amounted to 5,414 tons valued at \$111,198 as compared with shipments totalling 6,125 tons at \$103,536 in 1927.

The Canadian production of iron oxides is marketed in two forms, namely, crude and calcined. Crude oxides are dried before shipment, and are mostly used in the purification of illuminating gas, while the calcined product is ground usually for consumption in the paint industry.

Table 275.—Production of Iron Oxides in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	350	2,350	1901.....	2,233	16,735	1916.....	8,811	58,711
1887.....	485	3,733	1902.....	4,955	30,495	1917.....	9,409	87,605
1888.....	397	7,900	1903.....	6,266	32,760	1918.....	17,317	112,440
1889.....	794	15,280	1904.....	3,925	24,995	1919.....	11,862	113,427
1890.....	275	5,125	1905.....	5,105	34,675	1920.....	19,128	157,909
1891.....	900	17,750	1906.....	6,755	36,125	1921.....	9,048	93,610
1892.....	390	5,800	1907.....	5,828	35,570	1922.....	7,255	110,608
1893.....	1,070	17,700	1908.....	4,746	30,440	1923.....	10,424	129,636
1894.....	611	8,690	1909.....	3,940	28,093	1924.....	7,266	91,160
1895.....	1,339	14,600	1910.....	4,813	35,185	1925.....	7,118	91,913
1896.....	2,362	16,045	1911.....	3,622	28,333	1926.....	6,626	101,843
1897.....	3,905	23,560	1912.....	7,654	32,410	1927.....	6,125	103,536
1898.....	2,226	17,450	1913.....	5,987	41,774	1928.....	5,414	111,198
1899.....	3,919	20,000	1914.....	5,890	51,725			
1900.....	1,966	15,398	1915.....	6,248	48,353	Total.....	224,792	2,062,645

Table 276.—Production in Canada, Imports and Exports of Iron Oxides, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	6,626	101,843	6,125	103,536	5,414	111,198
IMPORTS—						
Ochres, ochrey earths, siennas, and umbers.....	2,949	97,405	2,654	90,614	3,279	111,751
Oxides, fire proofs, rough stuffs, fillers and colours, dry, n.o.p.....	3,054	560,116	3,356	632,470	3,485	709,529
EXPORTS—						
Mineral pigments, iron oxides and ochres..	808	34,259	852	34,800	1,124	44,342

Table 277.—Capital Employed in the Iron Oxides Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	133,719	134,854
Cost of supplies and stocks on hand.....	18,948	18,924
Cash, trading and operating accounts and bills receivable.....	650	473
Total.....	153,317	154,251

Table 278.—Employees, Salaries and Wages in the Iron Oxides Industry in Canada, 1927 and 1928

Class	1927		1928	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	3	3,750	3	4,074
Wage-earners.....	45	34,930	42	34,760
Grand total.....	48	38,680	45	38,834

Table 279.—Wage-Earners in the Iron Oxides Industry in Canada, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	20	23	July.....	54	43
February.....	20	23	August.....	56	49
March.....	23	23	September.....	50	46
April.....	35	23	October.....	48	48
May.....	40	28	November.....	37	38
June.....	52	39	December.....	35	37

MICA

Important deposits of mica in Canada are located in the counties of Hull and Labelle in Quebec, and Lanark, Leeds and Frontenac in Ontario. The product of these mines, in the main part, is shipped first to mica-trimming shops, conveniently located, where it is either rough-cobbed or split and trimmed prior to exportation to the United States or Great Britain.

Canadian mica production during 1928 totalled 3,660 tons valued at \$87,168 as compared with the 1927 shipments of 2,738 tons with a valuation of \$173,377. While greater quantities of scrap were shipped, and higher prices were obtained for this product than in the preceding year, due to gains in tonnages of screened scrap sold, these gains were insufficient to offset losses in sales of splittings and thumb-trimmed grades and the total value of the output for 1928 was 50 per cent below the figures for 1927. The decreased output of thumb-trimmed and split mica was largely due to competition in export trade. Mica from the island of Madagascar, the main source of phlogopite outside of Canada, is being imported into the United States, Canada's principal market, at a price below that at which the Canadian operator can afford to sell. Imports into Canada of mica and mica in manufactured form from both the United States and British India increased during the year.

Rough cobbed and thumb-trimmed mica exported amounted to 32 tons; splittings, 84 tons; and scrap and waste, 4,346 tons. The total value of Canadian mica exported during 1928 was \$175,761, which included shipments worth \$168,680 to the United States and \$4,712 to the United Kingdom.

It will be noted that the stated value of the exports of Canadian mica exceeded by a considerable amount the value placed on shipments reported by operators. An explanation of this, lies in the fact, that 46 per cent of the value of exported material consisted of mica splittings shipped from large trimming shops situated in Ontario and Quebec.

Table 280.—Production of Mica in Canada, by Provinces, 1886-1928

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1886.....		6,991		22,017		29,008
1887.....		8,276		21,540		29,816
1888.....	No record		15	30,207	15	30,207
1889.....		1,496		27,222		28,718
1890.....		9,590		58,484		68,074
1891.....		27,000		44,510		71,510
1892.....		23,000		81,745		104,745
1893*.....						75,719
1894*.....						45,581
1895*.....						65,000
1896*.....						60,000
1897.....		26,000		50,000		76,000
1898.....		106,375		12,000		118,375
1899.....		133,000		29,475		163,000
1900.....		106,000		60,000		166,000
1901.....		120,000		40,000		160,000
1902.....	66	34,304	993	101,600	1,059	135,904
1903.....		74,119		103,738		177,857
1904.....		76,487		84,290		160,777
1905.....		109,672		68,563		178,235
1906.....	283	159,334	291	144,579	574	303,913
1907.....	318	224,197	456	88,402	774	312,599
1908.....	148	82,613	288	57,258	436	139,871
1909.....	128	93,298	241	54,484	369	147,782
1910.....	316	87,285	442	103,090	758	190,385
1911.....	217	69,465	373	50,212	590	128,677
1912.....	196	81,044	384	62,932	580	143,976
1913.....	626	125,488	478	68,816	1,104	194,304
1914.....	246	62,794	349	46,267	595	109,061
1915.....	217	50,390	200	41,515	417	91,905
1916.....	844	192,343	364	62,896	1,208	255,239
1917.....	774	286,730	392	72,121	1,166	358,851
1918.....	481	229,119	266	42,431	747	271,550
1919.....	2,429	218,437	325	55,351	2,754	273,788
1920.....	737	281,460	1,466	94,562	2,203	376,022
1921.....	484	41,172	218	28,891	702	70,063
1922.....	1,360	97,748	1,989	54,515	3,349	152,263
1923.....	1,545	216,684	1,980	110,290	3,525	326,974
1924.....	1,677	185,020	2,414	172,252	4,091	357,272
1925.....	2,415	178,800	1,605	82,663	4,020	261,463
1926.....	1,664	170,118	881	59,086	2,545	229,204
1927.....	1,454	99,194	1,284	75,183	2,738	174,377
1928.....	1,101	54,224	2,559	32,944	3,660	87,168
Total.....						6,901,233

*Exports plus consumption—accurate separation of data by provinces not obtainable.

†Includes production from British Columbia valued at \$525.

Table 281.—Production of Mica in Canada by Grades, 1927 and 1928

	1927			1928		
	Pounds	Value f. o. b. shipping point	Price per pound	Pounds	Value f. o. b. shipping point	Price per pound
		\$	\$		\$	\$
Rough cobbled.....	255,925	16,913	0.08			
Thumb-trimmed.....	413,090	72,513	0.16	91,662	16,887	0.18
Splittings only.....	81,919	54,048	0.66	25,367	14,974	0.59
Scrap.....	4,693,058	30,873	0.007	7,202,795	55,307	0.008
Total.....	5,476,992	174,377	0.03	7,319,824	87,168	0.01

Table 282.—Production in Canada, Imports and Exports of Mica, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	1,664	170,118	1,454	99,194	1,101	54,224
Ontario.....	881	59,086	1,284	75,183	2,559	32,944
Total.....	2,545	229,204	2,738	174,377	3,660	87,168
IMPORTS—						
Mica and manufactures of, n.o.p.....		137,347		97,000		135,301
EXPORTS—						
Rough cobbled and thumb-trimmed.....	44	20,516	165	54,937	32	15,951
Splittings.....	315	432,345	159	213,651	84	80,902
Scrap and waste.....	3,799	45,297	4,536	57,499	4,346	78,262
Plate and manufactures (micanite).....		1,084		759		646
Total.....		499,242		326,846		175,761

Table 283.—Capital Employed in the Mica Mining Industry in Canada, by Provinces, 1927 and 1928

	1927			1928		
	Quebec	Ontario	Canada	Quebec	Ontario	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	103,698	22,842	126,540	97,351	27,842	125,193
Cost of supplies and stocks on hand.....	56,952	4,160	61,112	58,408	10,160	68,568
Cash, trading and operating accounts and bills receivable.....	47,624	17,296	64,920	49,017	17,296	66,313
Total.....	208,274	44,298	*322,389	204,776	55,298	260,074

*Includes capital for 1 firm in British Columbia.

Table 284.—Wage-Earners in the Mica Mining Industry in Canada, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	127	69	July.....	138	52
February.....	141	68	August.....	141	51
March.....	152	71	September.....	146	44
April.....	157	59	October.....	105	49
May.....	148	52	November.....	113	50
June.....	142	51	December.....	107	60

Table 285.—Employees, Salaries and Wages in the Mica Mining Industry in Canada, 1927 and 1928

	1927		1928	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	9	14,622	6	6,480
Wage-earners.....	159	103,883	88	35,679
Total.....	168	118,505	94	42,159

Table 286.—*World Production of Mica, 1913 and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
Canada (shipments).....	986	3,653	3,589	2,272	2,445	3,268
India (exports).....	2,288	4,112	4,985	4,497	3,874	4,774
Northern Rhodesia.....				4	8	4
Southern Rhodesia.....		134	130	163 (b)	183	183
Tanganyika Territory.....		55	68	52	42	33
Union of South Africa.....		892	1,054	1,130	1,660	3,572
Ceylon.....			1	(a)		
Australia.....		2	4	11	5	25
Total.....	3,274	8,848	9,831	8,129	8,217	11,859
FOREIGN COUNTRIES						
United States.....	5,511	4,856	9,457	7,258	6,282	5,902
Madagascar.....		274	282	325	497	625
Argentina (exports).....	6	118	117	83	75	(a)
Brazil.....	10	78	64	51	39	74
France (lithium mica).....				246	(a)	(a)
Japan.....		582	1,065	(a)	(a)	(a)
Germany (lithium mica).....			493	654	(a)	(a)
Guatemala.....			16	12	7	(a)
Chosen (Korea).....		23	20	16	(a)	(a)
Norway.....		25	23	41	8	84
Portugal (lithium mica).....				184	379	(a)
Russia (years ended Sept. 30).....		(a)	190	478	1,496	96
Sweden.....		4	93	52	10	12
Total.....	5,527	5,960	11,820	9,400	8,793	6,793
Grand total.....	8,801	14,808	21,651	17,529	17,010	18,652

*Source—Imperial Institute publications.

(a) Data not available.

(b) In addition 19 tons of lithium mica were produced.

QUARTZ

Quartz production in Canada, prior to 1906, was not remunerative enough to cause much activity in this industry. The earliest records available show that in 1890 a shipment of 200 tons valued at \$1,000 was made from a Quebec deposit. Small shipments were recorded in 1893, 1896, 1898 and 1899. During 1906 production commenced for the purpose of supplying flux and furnace linings to the industries in the Sudbury district of Ontario. Shipments from the Ontario quarries have been continuous since that date.

A new high mark was set up in this industry during 1928 when the production reached a total of 282,522 tons valued at \$523,933. During the previous year 233,984 tons worth \$496,364 were shipped from Canadian deposits.

Silex or crystallized quartz imported into Canada during 1928, principally from the United States, amounted to 2,865 tons valued at \$73,755. Flint imports decreased slightly in 1928 to a total of 3,545 tons appraised at \$36,204.

Table 287.—Production of Quartz in Canada, 1890-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1890.....	200	1,000	1908.....	44,741	52,830	1919.....	94,991	527,635
1891-1892.....			1909.....	56,924	71,285	1920.....	128,295	467,821
1893.....	100	500	1910.....	88,205	91,951	1921.....	100,350	312,947
1894-1895.....			1911.....	60,526	83,865			
1896.....	10	50				1922.....	109,947	208,598
			1912.....	100,242	195,216	1923.....	264,076	599,250
1897.....			1913.....	78,261	169,842	1924.....	150,896	323,156
1898.....	284	570	1914.....	54,148	84,583	1925.....	197,224	363,612
1899.....	600	1,260	1915.....	127,108	205,153	1926.....	232,082	553,161
1900-1905.....			1916.....	136,745	251,226			
1906.....	48,376	65,765				1927.....	233,984	496,364
			1917.....	216,288	496,182	1928.....	282,522	523,933
1907.....	56,585	124,148	1918.....	268,155	629,813			
						Total.....	3,131,865	6,901,716

Table 288.—Production in Canada, and Imports of Quartz, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Nova Scotia.....	8,333	29,018	4,834	16,721	7,424	28,022
Quebec.....	24,550	107,779	49,141	132,615	64,577	143,067
Ontario.....	192,733	339,304	159,150	266,204	194,503	308,608
Manitoba (Rose quartz).....					1	360
British Columbia.....	6,466	77,060	20,859	80,824	16,017	43,876
Total.....	232,082	553,161	233,984	496,364	282,522	523,933
IMPORTS—						
Silex.....	2,554	60,070	3,188	75,230	2,865	73,755
Flint.....	4,731	49,635	4,311	46,551	3,545	36,204

Table 289.—Capital Employed in the Quartz Mining Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	823,789	1,090,256
Cost of supplies and stocks on hand.....	103,430	51,246
Cash, trading and operating accounts and bills receivable.....	35,997	17,583
Total.....	963,216	1,159,085

Table 290.—Employees, Salaries and Wages in the Quartz Mining Industry in Canada, 1927 and 1928

	1927				1928			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	16	1	17	21,940	15	2	17	24,884
Wage-earners.....	250		250	249,615	241		241	197,788
Total.....	266	1	267	271,555	256	2	258	222,672

Table 291.—Wage-Earners in the Quartz Mining Industry in Canada, by Months, 1927 and 1928

Month	1927	1928	Month	1927	1928
January.....	173	106	July.....	245	224
February.....	173	129	August.....	214	238
March.....	219	96	September.....	186	207
April.....	227	110	October.....	170	188
May.....	227	174	November.....	164	124
June.....	236	196	December.....	150	103

SALT

The production of salt in the province of Ontario was first recorded in 1866 when a company was formed to drill for oil on the north bank of the Maitland river, and, while no success attended the efforts of the drillers in their search for oil, a bed of rock salt was found at a depth of 964 feet. In September, 1866, this company (incorporated under the name of the *Goderich Petroleum Company*, later changed to *Goderich Salt Company*) commenced pumping brine. In the initial working in connection with these deposits the refining was done by the kettle method, which was soon discarded and replaced by the pan method of evaporation. Wells were drilled and plants erected at Clinton and Seaforth, Ontario, and four refineries were in operation at Goderich in 1879; at the present time there are only two firms operating at Goderich.

Census reports show that there were 16 salt works in operation in Ontario and 2 in Nova Scotia during 1871. The Ontario plants employed 175 men with a total wage of \$60,990 while the products made were valued at \$119,999. In Nova Scotia during that year there were 10 employees who received \$2,040 and the total value of the plant production was \$16,600. According to the 1881 census, 26 plants were in operation in Ontario and 1 each in Nova Scotia and New Brunswick. Total employees that year numbered 247 earning \$78,517; products made were valued at \$395,848 and the capital invested in the operating plants was \$298,100. The development of the industry has reached the point where in 1927 the 11 plants in operation reported a capital investment of \$3,194,802; the number of employees was 376 who received salaries and wages amounting to \$499,967; products sold during the year had a valuation of \$1,614,667.

Salt production in Canada continues to increase; high records have been set up during each of the past three years. The 1928 production amounted to 299,445 tons valued at \$1,495,971, an advance of 11.5 per cent in quantity but a decrease in value of 7.3 per cent as compared with the 1927 total of 268,672 tons at \$1,614,667. The average price for all grades was \$5 per ton in 1928 as against \$6.01 in the previous year.

Ontario's production of 279,841 tons was 10 per cent higher than in the previous year and accounted for 93.5 per cent of the total Canadian output. Nova Scotia's output from the Malagash mine increased 36 per cent in 1928.

Importations of salt into Canada increased about 7 per cent to 189,025 tons evaluated at \$1,122,968. Exports of Canadian salt totalled 2,930 tons worth \$36,399.

Table 292.—Production of Salt in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	62,359	227,195	1901.....	59,428	262,328	1916.....	132,903	717,653
1887.....	60,173	166,394	1902.....	64,456	292,581	1917.....	138,909	1,047,792
1888.....	59,070	185,460	1903.....	62,452	297,517	1918.....	131,727	1,285,039
1889.....	32,832	129,547	1904.....	69,477	321,778	1919.....	148,301	1,397,929
1890.....	43,754	198,857	1905.....	67,340	320,858	1920.....	209,855	1,544,724
1891.....	45,021	161,179	1906.....	76,720	329,130	1921.....	164,658	1,673,685
1892.....	45,486	162,041	1907.....	72,697	342,315	1922.....	181,794	1,628,323
1893.....	62,324	195,926	1908.....	79,975	378,798	1923.....	202,397	1,715,516
1894.....	57,199	170,687	1909.....	84,037	415,219	1924.....	207,979	1,374,780
1895.....	52,376	160,455	1910.....	81,092	409,624	1925.....	233,746	1,410,697
1896.....	43,960	169,693	1911.....	91,582	443,004	1926.....	262,547	1,480,149
1897.....	51,348	225,730	1912.....	95,053	459,582	1927.....	268,672	1,614,667
1898.....	57,142	248,639	1913.....	100,791	491,280	1928.....	299,445	1,495,971
1899.....	59,339	254,390	1914.....	107,038	493,648			
1900.....	62,055	279,458	1915.....	119,900	600,226	Total.....	4,612,409	27,178,464

Table 293.—Production of Salt in Canada, by Grades, 1927 and 1928

Grade	1927			1928		
	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)
	Tons	Tons	\$	Tons	Tons	\$
Table and dairy.....	53,649	53,477	802,922	56,252	56,214	708,927
Common fine.....	46,808	47,185	297,824	52,112	51,055	258,781
Common coarse.....	41,754	39,617	309,667	47,328	46,146	311,301
Land salt.....	5,955	5,829	37,072	3,662	3,685	17,798
Other grades.....	6,740	6,569	51,187	7,019	7,207	63,874
Brine for chemical works (Salt equivalent sold or used).....	115,995	115,995	115,995	135,138	135,138	135,290
Total.....	270,901	268,672	1,614,667	301,511	299,445	1,495,971
Value of packages.....			524,437			560,822
Grand total.....			2,139,104			2,056,793

Table 294.—Production in Canada, Imports, Exports and Consumption of Salt, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	262,547	1,480,149	268,672	1,614,667	299,445	1,495,971
IMPORTS—						
Salt, for the use of the sea or gulf fisheries	83,929	327,040	62,102	328,824	74,192	417,594
Salt, in bulk, n.o.p.....	75,965	393,747	72,933	321,538	68,765	254,218
Salt, n.o.p., in bags, barrels, etc.....	28,053	284,118	40,882	376,648	45,589	416,149
Salt, table, made by an admixture of other ingredients, when containing not less than 90 per cent of pure salt. (From April 1, 1926).....	454	31,689	844	55,070	479	35,007
Total.....	188,401	1,036,594	176,761	1,082,080	189,025	1,122,963
EXPORTS.....	1,164	19,423	1,212	22,793	2,930	36,399
APPARENT CONSUMPTION OF SALT.....	449,784	2,497,320	444,221	2,673,954	485,540	2,582,540

Table 295.—Capital Employed in the Salt Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	2,330,112	3,731,953
Cost of supplies and stocks on hand.....	321,007	235,405
Cash, trading and operating accounts and bills receivable.....	543,683	455,564
Total.....	3,194,802	4,422,922

Table 296.—Employees, Salaries and Wages in the Salt Industry in Canada, 1927 and 1928

	1927				1928			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
Salaried employees.....	40	14	54	\$ 121,100	45	16	61	\$ 117,376
Wage-earners.....	285	37	322	378,867	394	.....	394	422,399
Total.....	325	51	376	499,967	439	16	455	539,775

Table 297.—Wage-Earners in the Salt Industry in Canada, by Months, 1927 and 1928

Month	1927		1928		Month	1927		1928	
	Male	Female	Male	Female		Male	Female	Male	Female
January.....	247	36	316	30	July.....	285	35	380	35
February.....	268	39	342	31	August.....	293	34	377	34
March.....	280	37	346	34	September.....	286	35	347	40
April.....	293	36	366	37	October.....	295	37	340	39
May.....	291	36	401	34	November.....	291	44	351	39
June.....	290	38	377	37	December.....	284	32	330	37

Table 298.—*World Production of Salt, 1913 and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
United Kingdom.....	2,203,732	2,045,762	1,933,590	1,727,443	1,983,486	1,946,318
Mauritius (estimated).....	(a)	1,500	1,500	1,500	1,500	1,500
Nigeria (estimated).....	394	400	400	400	400	400
Somaliland (exports).....	(a)	1,446	2,336	2,077	2,367	(a)
South-West Africa Territory.....	(a)	335	425	357	338	144
Anglo-Egyptian Sudan.....	4,601	9,000	9,000	9,194	9,716	9,000
Tanganyika Territory.....	(a)	4,556	4,000	3,105	4,775	5,053
Uganda.....				1,715	2,017	2,034
Union of South Africa (years ended June 30).....	42,837	69,258	58,333	79,245	79,146	(a)
Canada (shipments).....	89,992	185,695	208,702	234,417	239,886	267,361
West Indies (exports)—						
Bahamas.....	26,000	1,570	1,291	7,400	1,900	700
Turks & Caicos Islands.....		52,327	62,432	53,958	27,923	50,043
Ceylon.....	13,190	9,263	20,263	15,962	25,668	43,576
Cyprus (estimated).....		22	3,000	3,000	3,000	3,000
India (including Aden).....	1,472,764	1,623,475	1,295,144	1,638,749	1,611,945	1,515,349
Weihaiwei (estimated).....	(a)	2,000	2,000	2,000	2,000	2,000
Palestine.....						1,654
Australia.....	64,981	110,687	126,251	139,101	123,212	130,785
Total.....	3,918,491	4,117,296	3,728,667	3,919,623	4,119,279	3,978,917
FOREIGN COUNTRIES						
Austria.....	358,887	109,382	128,705	142,849	145,741	151,389
Bulgaria.....	(a)	36,000	25,000		3,919	4,043
Czechoslovakia.....	See Austria	122,768	75,591	96,556	120,272	151,678
France.....	1,261,364	1,267,881	(b) 1,327,049	(b) 1,617,405	1,315,300	1,571,699
Germany.....	2,064,391	1,941,973	2,188,347	2,406,772	2,758,524	2,863,384
Greece.....	18,906	67,440	3,507	88,309	102,730	(c) 57,661
Italy.....	693,722	794,346	900,922	754,150	1,030,475	889,387
Jugoslavia.....	26,843	48,079	53,638	51,435	53,900	51,305
Netherlands.....	(a)	31,895	34,191	34,894	37,439	40,815
Poland.....	See Russia	365,217	423,197	450,646	530,694	550,337
Portugal.....				54	21	(a)
Rumania.....	329,613	297,895	325,179	338,628	322,847	337,365
Russia.....	1,963,405	998,442	1,404,862	1,823,344	2,387,651	2,286,563
Spain.....	600,612	952,744	846,556	1,079,939	963,754	(a)
Switzerland.....	506,718	72,651	79,954	76,047	77,026	78,719
Algeria.....	26,666	23,161	26,579	42,534	36,353	10,802
Belgian Congo (estimated).....	79	80	80		80	80
Egypt (exports).....	154,640	206,584	207,795	177,394	219,020	165,222
Eritrea (estimated).....	19,678	20,000	20,000	20,000	20,000	20,000
French Morocco.....				1,200	(a)	(a)
French Somaliland.....				31,474	16,381	28,272
French West Africa (Mauritania).....				4,400	4,200	4,000
Tripoli (estimated).....	(a)	(a)	19,000	19,000	19,000	19,000
Tunis.....	(a)	121,619	126,378	130,978	(a)	(a)
Dutch West Indies (exports).....	13,201	8,751	18,087	9,999	(a)	(a)
Mexico (estimated).....	65,923	66,000	66,000	66,000	66,000	66,000
United States.....	4,298,638	6,074,210	6,604,909	6,581,786	6,757,759	7,209,553
Argentina (railway shipments).....	54,034	120,464	74,160	95,128	(a)	(a)
Chile.....	19,244	35,513	28,863	34,352	70,419	(a)
Colombia (estimated).....	28,534	29,000	29,000	29,000	29,000	29,000
Peru.....	24,040	28,513	23,002	29,638	29,695	(a)
Venezuela (estimated).....	(a)	30,000	30,000	30,000	30,000	30,000
China including Kwantung Peninsula (estimated).....	1,700,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Dutch East Indies.....	100,449	129,741	434,364	375,173	247,484	(a)
Formosa.....	72,869	134,000	136,000	133,059	111,600	(a)
French Indo-China (exports).....	(a)	4,184	5,861	20,152	27,283	35,249
Japan.....	629,721	626,929	657,935	710,528	1,067,944	(a)
Portuguese India (estimated).....	11,807	12,000	12,000	12,000	12,000	12,000
Siam.....	(a)	39,923	124,094	123,685	113,534	117,447
Turkey (Anatolia) (estimated).....	(a)	100,000	100,000	100,000	100,000	100,000
Philippine Islands.....	19,186	28,454	30,120	23,695	65,616	(a)
Total.....	14,973,070	16,946,042	18,584,885	19,762,283	20,893,641	18,890,970
Grand total.....	18,891,561	21,063,338	22,313,552	23,681,906	25,012,920	22,869,887

*Source—Imperial Institute publications.

(a) Data not available.

(b) Exclusive of sea salt.

(c) Sales.

TALC AND SOAPSTONE

Shipments of talc and soapstone ranging from 50 tons to 1,420 tons were made from Canadian deposits during the period 1886 to 1906. Prior to 1900 the production consisted mainly of impure talc and soapstone shipped from Quebec. It was not until 1900 that mining operations were commenced on the high grade talc deposits of the Madoc district. Ground talc was shipped from this district in 1906. Production advanced during the ensuing years until in 1920 the high mark for the industry was reached, namely, 21,671 tons valued at \$166,934, an average of \$7.70 per ton. In the following year the 4 companies operating employed 34 men and produced 10,124 tons with an average value of \$14.28 per ton. During 1928, the 5 firms operating in this industry employed 91 persons. Production of talc and soapstone in Canada during 1928 was valued at \$219,358, as compared with shipments in 1927 amounting to 16,521 tons valued at \$236,105.

Quebec shipments were made from quarries in the Eastern townships and consisted principally of soapstone blocks for use in lining the alkali recovery furnaces of sulphate (kraft) pulp mills. Ontario's production was wholly of talc obtained from deposits near Madoc, Hastings county.

Imports into Canada during 1928 of talc or soapstone, ground or unground, amounted to 5,421 tons appraised at \$91,702. Exports of talc were recorded at 10,946 tons worth \$133,601.

Table 299.—Production of Talc and Soapstone in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	50	400	1901.....	259	842	1916.....	13,104	49,423
1887.....	100	800	1902.....	689	1,804	1917.....	15,803	76,539
1888.....	140	280	1903.....	990	2,739	1918.....	18,169	119,197
1889.....	195	1,170	1904.....	840	1,875	1919.....	18,642	116,295
1890.....	917	1,239	1905.....	500	1,800	1920.....	21,671	166,934
1891.....			1906.....	1,234	3,030	1921.....	10,124	144,565
1892.....	1,374	6,240	1907.....	1,534	4,602	1922.....	13,195	188,458
1893.....	717	1,920	1908.....	1,016	3,048	1923.....	10,366	150,507
1894.....	916	1,640	1909.....	4,350	10,300	1924.....	11,332	154,480
1895.....	475	2,138	1910.....	7,112	22,308	1925.....	14,474	205,835
1896.....	410	1,230	1911.....	7,300	22,100	1926.....	15,767	217,195
1897.....	157	350	1912.....	8,270	23,132	1927.....	16,521	236,105
1898.....	405	1,000	1913.....	12,250	45,980	1928.....	16,058	219,358
1899.....	450	1,960	1914.....	10,803	40,418			
1900.....	1,420	6,365	1915.....	11,885	40,554	Total.....	271,959	2,296,155

Table 300.—Production in Canada, Imports and Exports of Talc and Soapstone, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Soapstone.....	995	42,609	1,411	57,174		40,171
Talc.....	14,772	174,586	15,110	178,931	14,925	179,187
Total.....	15,767	217,195	16,521	236,105		219,358
IMPORTS—						
Talc or soapstone, ground or unground...	4,213	89,026	4,907	86,858	5,421	91,702
EXPORTS—						
Talc, crude.....			12	154	10,946	133,601
Talc, refined.....	10,823	125,633	10,692	125,123		

Table 301.—Capital Employed in the Talc and Soapstone Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	637,365	616,457
Cost of all supplies and stocks on hand.....	36,114	31,494
Cash, trading and operating accounts and bills receivable.....	41,960	84,657
Total.....	715,439	732,608

Table 302.—Employees, Salaries and Wages in the Talc and Soapstone Industry in Canada, 1927 and 1928

	1927				1928			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
Salaried employees.....	11	2	13	\$ 15,193	7	2	9	\$ 17,410
Wage-earners.....	109	.....	109	72,523	82	.....	82	67,751
Total.....	120	2	122	87,721	89	2	91	85,161

Table 303.—Wage-Earners in the Talc and Soapstone Industry in Canada, by Months, 1927 and 1928

Month	1927	1928	Month	1927	1928
January.....	81	78	July.....	101	82
February.....	79	75	August.....	90	81
March.....	84	75	September.....	92	82
April.....	87	73	October.....	81	86
May.....	87	80	November.....	84	77
June.....	91	75	December.....	84	75

Table 304.—*World Production of Talc and Soapstone, 1913 and 1924-1928

(Long tons)

Country	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
United Kingdom.....	40					161
Union of South Africa.....		670	85	41	344	518
Canada (shipments).....	10,937	10,118	12,923	14,078	14,751	13,326
India.....	2,524	2,852	8,525	9,674	5,053	5,539
Australia.....	104	859	1,052	911	1,069	1,327
Total.....	13,605	14,499	22,585	24,704	21,217	20,871
FOREIGN COUNTRIES						
Austria (exports).....	7,953	9,433	12,679	13,642	16,864	19,443
China.....		218	50	(a)	(a)	.....
France.....	59,208	68,250	68,256	74,544	(a)	(a)
Germany (Bavaria).....		3,933	3,405	3,772	6,280	(a)
Greece.....		137	92	149	210	30
Italy.....	44,622	28,171	33,089	42,355	32,400	32,469
Norway (exports).....	2,392	11,596	8,889	7,488	7,487	7,698
Rumania.....				480	860	2,130
Russia (years ended Sept. 30).....				2,948	2,085	2,717
Spain.....	4,336	1,434	898	3,800	4,280	(a)
Sweden.....		2,827	2,337	2,876	3,420	4,799
United States.....	156,994	181,983	(b) 162,727	(b) 162,114	171,711	181,229
Uruguay (exports).....		(a) 899	899	883	1,085	(a)
Japan.....		41,194	43,385	(a)	59,000	(a)
Total.....	275,505	349,176	336,706	315,051	305,682	250,515
Grand total.....	289,110	363,675	359,291	339,755	326,899	271,386

*Source—Imperial Institute publications.

(a) Data not available.

(b) Talc only.

MISCELLANEOUS NON-METAL MINING INDUSTRIES

Included under this heading are the following non-metallic minerals:

Actinolite	Mineral waters
Barytes	Natro-alunite
Bituminous sands	Phosphate
Fluorspar	Pyrites
Lithium minerals	Silica brick
Magnesite	Sodium carbonate
Magnesium sulphate	Sodium sulphate
Manganese, bog.	

Statistics relating to capital, labour, fuel and power are combined for these industries and are shown in Tables 404 to 430.

In addition to the foregoing, data are also shown for production, imports and exports of sulphuric acid.

Table 395.—Capital Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	2,972,352	3,954,644
Cost of supplies and stocks on hand.....	222,876	387,084
Cash, trading and operating accounts and bills receivable.....	120,152	156,773
Total.....	3,315,380	4,478,481

Table 306.—Employees, Salaries and Wages in the Miscellaneous Non-Metal Mining Industries, 1927 and 1928

	1927				1928			
	Number of employees			Salaries and wages	Number of employees			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	27	4	31	45,910	36	5	41	73,118
Wage-earners.....	273		273	267,428	353		353	341,532
Total.....	300	4	304	313,338	389	5	394	414,650

Table 307.—Wage-Earners in the Miscellaneous Non-Metal Mining Industries, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	179	205	July.....	249	284
February.....	117	206	August.....	259	288
March.....	170	219	September.....	289	327
April.....	217	201	October.....	296	329
May.....	281	320	November.....	281	289
June.....	310	319	December.....	211	228

ACTINOLITE

Actinolite, which is a calcium-magnesium-iron silicate, is used in the manufacture of coal-tar roofing compounds. Mining of this mineral in Canada commenced in 1883. Canadian deposits from which production has been derived are located in Elzevir and Kaladar townships, Hastings county; Actinolite is the centre of this industry. In 1902 and 1903 production was at its peak and 550 tons were shipped; however, during the following six years, no operations were carried on. Shipments recommenced in 1910 and have continued up to the present. Annual production of ground actinolite during the past 9 years has ranged between 40 tons and 100 tons. In 1928, shipments to the United States from Canadian deposits amounted to 70 tons valued at \$875.

Table 308.—Production of Actinolite in Canada, 1897-1928

Year	Tons	Value	Year	Tons	Value
		\$			\$
1897.....	205	1,845	1917.....	120	1,320
1898-1900.....			1918.....	228	2,508
1901.....	521	3,126	1919.....	80	880
1902.....	550	4,400	1920.....	100	1,160
1903.....	550	3,108	1921.....	78	975
1904-1909.....			1922.....	50	575
1910.....	30	330	1923.....	53	583
1911.....	67	736	1924.....	90	1,225
1912.....	92	1,000	1925.....	40	500
1913.....	66	720	1926.....	80	1,000
1914.....	119	1,304	1927.....	86	1,075
1915.....	220	2,420	1928.....	70	875
1916.....	250	2,750	Total.....	3,745	34,415

BARYTES

Deposits of barytes at Five Islands, Colchester county, and Brookfield, Hants county, Nova Scotia were first operated between 1865 and 1870. These deposits have produced about 5,000 tons of barytes. The McKellar Island deposit in Thunder Bay district, Ontario, in the course of its operations produced several thousand tons of ore. Work ceased on this property in 1894.

Large deposits of barytes at Lake Ainslie, Cape Breton Island, were opened up in 1894 and operations in this district have been practically continuous since that date. Between 1900 and 1903 the Cap Rouge deposit in North Cheticamp district was operated.

During 1918 a deposit in Langmuir township, Ontario, was operated and a mill for grinding and preparing barytes was completed shortly before the close of navigation. A shipment of 60 tons was made. Development work was done on the Bellew mine in North Burgess township in 1918. A deposit near Tionaga station was operated in 1923 and 200 tons of barytes were shipped.

Barytes shipped during 1928 amounted to 127 tons valued at \$2,847 as compared with 56 tons worth \$1,268 produced in 1926. The total output as in the past two years was obtained from the Johnson mine at Lake Ainslie, Inverness county, Nova Scotia.

Imports of barytes into Canada during 1928 totalled 2,878 tons with a valuation of \$58,710.

Table 309.—Production of Barytes in Canada, 1885-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1885.....	300	1,500	1900.....	1,337	7,605	1915.....	550	6,875
1886.....	3,864	19,270	1901.....	653	3,842	1916.....	1,368	19,393
1887.....	400	2,400	1902.....	1,096	3,957	1917.....	3,490	54,027
1888.....	1,100	3,850	1903.....	1,163	3,931	1918.....	640	10,165
1889.....			1904.....	1,382	3,702	1919.....	468	8,154
1890.....	1,842	7,543	1905.....	3,360	7,500	1920.....	751	22,983
1891.....			1906.....	4,000	12,000	1921.....	270	9,567
1892.....	315	1,260	1907.....	1,344	3,000	1922.....	289	9,537
1893.....			1908.....	4,312	19,021	1923.....	409	8,548
1894.....	1,081	2,830	1909.....	179	1,120	1924.....	151	3,308
1895.....			1910.....			1925.....	95	2,259
1896.....	145	715	1911.....	50	400	1926.....	100	2,307
1897.....	571	3,060	1912.....	464	5,104	1927.....	56	1,268
1898.....	1,125	5,533	1913.....	641	5,410	1928.....	127	2,847
1899.....	720	4,402	1914.....	612	6,169			
						Total.....	40,820	296,362

Table 310.—Production in Canada and Imports of Barytes, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	100	2,307	56	1,268	127	2,847
IMPORTS—						
Barium peroxide.....	11	2,311	35	3,195	7	1,304
Blanc fixe.....	427	22,645	511	28,053	622	35,470
Barytes.....	2,422	48,011	2,841	58,504	2,878	58,710
Lithopone.....	6,295	520,249	7,902	644,175	8,144	717,207
Satin white.....	1,055	29,714	1,044	29,528	1,413	46,703

BITUMINOUS SANDS

Bituminous sands are found in the Fort McMurray district, Alberta. This deposit is the largest occurrence of solid asphaltic material known. Considerable research work has been done in connection with these sands by the *Scientific and Industrial Research Council of Alberta* and the *Dominion Department of Mines*. Shipments of bituminous sands up to 1924 amounted to 531 tons. In 1925, the production was 1,148 tons at \$4,594; in 1926, shipments totalled 528 tons at \$2,112; and in 1927, the total was 2,706 tons valued at \$10,824. During these three years, the McMurray Asphaltum and Oil Company and the Federal Department of Mines were the only producers. During 1928, shipments amounting to 94 tons valued at \$374 were made.

Table 311.—Production of Bituminous Sands in Canada and Imports of Asphalt, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Bituminous sands.....	528	2,112	2,706	10,824	94	374
IMPORTS—						
Asphalt, solid.....	19,663	404,848	47,737	856,225	47,991	822,425
Asphalt, not solid.....		17,510		38,566		46,890
Asphaltum oil for paving purposes.....		21,993		70,986		95,562
Total		444,356		965,777		964,877

FLUORSPAR

The first recorded shipment of fluorspar from a Canadian deposit was made in 1905, when 12 tons were shipped from a mine in Madoc township, Ontario. Five years later about 200 tons were mined in Huntingdon township of which quantity 2 tons were shipped. In 1911, the metallurgical works at Deloro and the steel foundries at Welland received small shipments. The next year a further small production was recorded, however in the following three years no shipments were made. During 1916, Ontario companies shipped 1,284 tons and increasing tonnages were produced during 1917 and 1918. In the latter year British Columbia became a factor in this industry as the Rock Candy mine near Grand Forks commenced operations.

The largest production from Canadian deposits took place in 1920 when 11,235 tons were shipped. Four mines were operated in that year employing 119 men whose wages totalled \$123,050.

No production of fluorspar was reported in Canada during the past three years. In 1925 the production amounted to 3,886 tons with a valuation of \$19,234. Importations of fluorspar at 14,362 tons valued at \$153,046 showed a marked increase over the total of 4,561 tons valued at \$58,701 imported during 1927.

Table 312.—Production of Fluorspar in Canada, by Provinces, 1905-1928

	Ontario		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1905.....	12				12	
1906-1909.....						
1910.....	2	15			2	15
1911.....	34	238			34	238
1912.....	40	240			40	240
1913-1915.....						
1916.....	1,284	10,238			1,284	10,238
1917.....	4,249	68,756			4,249	68,756
1918.....	7,187	150,779	175	5,250	7,362	156,029
1919.....	3,425	59,281	1,638	32,556	5,063	97,837
1920.....	3,758	68,475	7,477	171,971	11,235	240,446
1921.....	116	1,744	5,403	134,523	5,519	136,267
1922.....	284	3,905	4,219	98,233	4,503	102,138
1923.....	64	597	75	1,135	139	1,732
1924.....	76	1,343			76	1,343
1925.....	12	200	3,874	19,034	3,886	19,234
1926-1928.....						
Total.....	20,543	365,811	22,861	468,702	43,404	834,513

Table 313.—Production in Canada and Imports of Fluorspar, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....						
IMPORTS—						
Hydrofluosilicic acid.....	2	565	5	811	6	1,646
Fluorspar.....	9,968	97,482	4,561	58,701	14,362	153,046

LITHIUM MINERALS

CANADA

In a statement prepared by J. F. Wright, *Federal Department of Mines*, Ottawa, Canada, on the subject of lithium minerals, there are the following remarks:—

An outcrop of massive lepidolite was discovered in July, 1924, about one mile south of the Winnipeg river, some 10 miles east and a little north of Pointe du Bois. The Manitoba lithium deposits are the only ones of possible commercial value known within the British Empire.

At the Silver Leaf Mining Syndicate deposit, the lithium minerals occur in pockets and lenses in the central portion of a body of pegmatite which is exposed for 125 feet in a general east-west direction and across an average width of 80 feet. An analysis of a hand-picked sample, judged to represent approximately the lithium-bearing rock after the gangue has been removed, gave 4.76 per cent lithia (Li_2O). There is estimated to be between 2,500 and 3,000 tons of this type of ore for each 10 feet in depth within a horizontal area equal to that at the surface. Two lens-shaped bodies of lepidolite, or a lithia mica of like character, estimated to contain about 540 tons of lithia ore for each 10 feet in depth and averaging 3.87 per cent lithia, occur near the south side of the pegmatite mass. This lithia mica contains only one-tenth of one per cent iron (Fe_2O_3), and therefore probably will be found satisfactory for the manufacture of opal, white and flint glass."

Active development commenced in 1925, camps being put up, and a compressor, drills, and gasoline engines installed. Three miles of pole tram-line and winter road were built to a point on the Winnipeg river a short distance below Lamprey Falls. A considerable tonnage of ore has been blasted out and some small shipments made to England, Germany and the United States. Transportation is not difficult as barges may be floated down the river to the railhead, Pointe du Bois.

MAGNESITE

Magnesite was discovered in Grenville township in 1900 but it was not until 1907 that work on a small scale was started on the deposits. The following year 120 tons were shipped for the manufacture of carbonic acid gas for the aerated waters industry and for use in making flooring cement.

The cutting off of the Austrian supply of magnesite to North America in 1914 brought attention to the Grenville deposits as a substitute in the manufacture of refractory brick and lining for metallurgical furnaces.

Operations in 1915 accounted for the employment of 110 men whose wages amounted to \$23,607 and the year's production was 14,779 tons. The next year 183 men were employed earning \$144,987 and producing 55,413 tons. From the point of tonnage produced 1917 was the record year for the magnesite industry in Canada as 58,090 tons were shipped with an average value of \$12.54 per ton; 296 men were on the payrolls with wages totalling \$194,864. Advances in prices took place in 1918 and consequently, although the production of 39,365 tons was 32.5 per cent less than the previous year, the value of \$1,016,765 was a record one for the industry. In 1918 employment was furnished 305 men who received \$326,417.

The hydromagnesite deposits near Atlin, British Columbia, were operated during 1915 and 1916; shipments recorded for the latter year amounted to 635 tons and were made to the eastern United States and to Great Britain. During 1921 a further shipment of 803 tons was made from these deposits. However, there has been no production since that date.

The Canadian production fell off sharply in 1921 to 3,730 tons but recovered somewhat in 1923 to 4,801 tons. In 1925 shipments totalled 5,576 tons valued at \$122,325; during 1927 a total of 7,337 tons were shipped with a valuation of \$230,309. An appreciable increase was recorded in the shipments of magnesite in 1928, when 13,195 tons worth \$346,990 were produced.

All the magnesite mined during 1928 was produced in the province of Quebec and was sold in two forms, namely, dead-burned and calcined. Dead-burned magnesite is used entirely in the metallurgical industry as a refractory lining for furnaces. Calcined magnesite is used as a plastic material for floors and walls in buildings and also in the manufacture of pipe and furnace coverings, as it has strong insulating properties.

Exports of magnesite, calcined and dead-burned, in 1928 were recorded at 1,837 tons worth \$44,101 as against 1,953 tons valued at \$47,487 in 1927. The 1927 and 1928 exportations were principally to the United Kingdom.

Table 314.—Production of Magnesite in Canada, 1908-1928

Year	Tons	Value	Year	Tons	Value
		\$			\$
1908.....	120	840	1919.....	11,273	328,465
1909.....	330	2,508	1920.....	18,378	512,756
1910.....	323	2,160	1921.....	3,730	81,320
1911.....	991	5,531	1922.....	2,849	76,294
1912.....	1,714	9,645	1923.....	4,801	134,382
1913.....	515	3,335	1924.....	3,873	101,356
1914.....	358	2,240	1925.....	5,576	122,325
1915.....	14,779	126,584	1926.....	4,571	137,431
1916.....	55,413	563,829	1927.....	7,337	230,309
1917.....	58,090	728,275	1928.....	13,195	346,990
1918.....	39,365	1,016,765	Total.....	247,581	4,533,340

Table 315.—Production in Canada, Imports and Exports of Magnesite, 1926-1928

	1926		1927		1928	
	Tons	Value \$	Tons	Value \$	Tons	Value \$
Crude, mined.....	12,598		20,418		36,719	
Crude, calcined.....	9,870		18,593		31,488	
PRODUCTION—Calcined and dead-burned....	4,571	137,431	7,337	230,309	13,195	346,990
IMPORTS—						
Magnesia pipe covering.....		122,411		157,982		187,381
Magnesite.....	150	6,746	166	5,805	220	9,543
Magnesite firebrick.....		66,429		118,457		140,944
EXPORTS—						
Magnesite, calcined or dead-burned.....	653	19,587	1,933	47,487	1,837	44,101

Table 316.—*World Production of Magnesite, 1913 and 1924-1928

(Long tons)

Producing country and description	1913	1924	1925	1926	1927	1928
BRITISH EMPIRE						
Cyprus—						
Crude magnesite.....		220				
Union of South Africa—						
Crude magnesite.....	396	1,970	1,795	1,854	1,810	1,457
Canada—						
Crude magnesite (mined).....		9,362	3,767	11,248	18,231	32,785
Caustic magnesite.....		1,370	4,979	4,081	6,551	11,781
Dead-burnt magnesite.....		2,088				
India—						
Crude magnesite.....	16,198	24,461	29,620	30,461	19,638	24,406
Australia—						
Crude magnesite.....	7,104	12,850	14,721	10,583	10,419	10,786
FOREIGN COUNTRIES						
Austria—						
Crude magnesite.....	197,717	1,607	336	233,000	350,000	305,000
Caustic magnesite (b).....	(a)	6,269	10,425	9,000	20,000	37,000
Dead-burnt magnesite (b).....	(a)	72,713	76,788	94,000	123,000	109,879
Bricks.....				(a)	45,000	41,000
Czechoslovakia—						
Crude magnesite (b).....		4,738	7,098	12,374	11,550	8,278
Calcined magnesite (b).....		25,885	29,207	33,070	34,132	37,018
Greece—						
Crude magnesite.....	116,157	64,655	89,394	94,128	83,150	102,772
Caustic magnesite.....	(a)	20,058	28,829	26,368	27,000	25,787
Dead-burnt magnesite.....	(a)	1,124		1,194	1,343	128
Italy—						
Crude magnesite.....	590	13,220	14,907	19,529	16,047	11,690
Jugoslavia (Serbia only)—						
Crude magnesite.....				(a)	1,653	6,168
Norway—						
Crude magnesite.....	645	1,944	1,672	704	1,073	917
Calcined magnesite (exports).....	(a)	458	445	198	262	(a)
Magnesia bricks (exports).....	(a)	516	405	304	269	(a)
Russia—						
Crude magnesite.....		(a)	74,642	101,390	104,900	(a)
Caustic magnesite.....			2,190	2,046	2,933	(a)
Dead-burnt magnesite.....		14,243	19,691	27,252	28,924	(a)
Magnesia bricks.....			10,535	11,865	13,900	(a)
Spain—						
Crude magnesite.....	943					
United States—						
Crude magnesite.....	8,600	107,232	107,732	119,200	108,473	113,563
Caustic (sales).....				16,589	12,402	8,552
Dead-burnt (sales).....				37,982	35,902	43,732

*Source—Imperial Mineral Resources publications.

(a) Data not available.

(b) Exports less imports.

MAGNESIUM SULPHATE

In 1915 work commenced on the Spotted Lake deposit of magnesium sulphate, near Kruger mountain, Osoyoos division, British Columbia. Shipments were made of this material to the drug trade during 1915 and 1916. Crude magnesium sulphate to a total of 2,600 tons was extracted in 1917 of which quantity 929 tons were shipped to Oroville, Washington. The following year a deposit near Clinton, Lillooet district, was also operated. Preliminary shipments were made in 1920 from several lakes, containing these salts, on the Basque ranch, near Ashcroft, British Columbia.

No activities have been reported in this industry in Canada since 1923. In that year 121 tons of refined magnesium sulphate were shipped from the Basque ranch deposit.

Imports of magnesium sulphate or epsom salts during 1928 reached a total of 2,508 tons valued at \$47,717; in the previous year 2,404 tons worth \$39,195 were brought into Canada.

Table 317.—Production of Magnesium Sulphate in Canada, 1917-1928

Year	Tons	Value
		\$
1917.....	929	4,645
1918.....	1,949	14,565
1919.....	738	9,115
1920.....	1,947	39,886
1921.....	2,029	39,506
1922.....	1,021	24,017
1923.....	121	6,580
1924-1928.....		
Total.....	8,734	138,314

MANGANESE, BOG

During 1928 shipments of bog manganese from a deposit at Dawson Settlement, near Hillsborough, New Brunswick, amounted to 385 tons worth \$2,237. This material was shipped to the province of Quebec for use as a colouring agent in the brick trade.

MINERAL WATERS

A record of all the natural mineral waters produced in Canada and sold to the general public for medicinal purposes since 1888 has been compiled. In that year 124,850 gallons were produced and during the following ten years production varied between 424,600 gallons and 767,460 gallons. However, from 1899 to 1920 only the value of the shipments has been recorded; the high mark for the industry was reached in 1911 when the production was valued at \$223,758. Since 1920 shipments have fallen off to a marked degree; in 1922, production was 221,433 gallons worth \$14,220. Shipments from mineral springs and wells in Canada during 1928 totalled 269,045 gallons valued at \$33,498 as against an output of 303,530 gallons at \$14,624 in 1927. The 1928 total consisted of 15,415 gallons from Quebec and 253,630 gallons from Ontario.

Table 318.—Production of Mineral Waters in Canada, 1888-1928

Year	Imp. gal.	Value	Year	Value	Year	Imp. gal.	Value
		\$		\$			\$
1888.....	124,850	11,456	1903.....	100,000	1918.....		154,468
1889.....	424,600	37,360	1904.....	100,000	1919.....		71,015
1890.....	561,165	66,031	1905.....	100,000	1920.....		24,582
1891.....	427,485	54,268	1906.....	100,000	1921.....	328,273	21,716
1892.....	640,380	75,348	1907.....	136,020	1922.....	221,433	14,220
1893.....	725,096	108,347	1908.....	151,953	1923.....	232,451	16,455
1894.....	767,460	110,040	1909.....	175,173	1924.....	209,353	15,421
1895.....	739,382	126,048	1910.....	199,563	1925.....	190,134	28,413
1896.....	706,372	111,736	1911.....	223,758	1926.....	215,356	29,721
1897.....	749,691	141,477	1912.....	172,465	1927.....	303,530	14,624
1898.....	555,000	100,000	1913.....	173,677	1928.....	269,045	33,498
1899.....	100,000	1914.....	134,111				
1900.....	75,000	1915.....	115,274		Total.....		3,896,838
1901.....	100,000	1916.....	127,806				
1902.....	100,000	1917.....	145,814				

Table 319.—Production in Canada, Imports and Exports of Mineral Waters, 1926-1928

	1926		1927		1928	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		\$		\$		\$
PRODUCTION, by provinces—						
Quebec.....	6,956	2,444	10,330	1,813	15,415	5,608
Ontario.....	208,400	27,277	293,200	12,811	253,630	27,890
Total.....	215,356	29,721	303,530	14,624	269,045	33,498
IMPORTS—Mineral and aerated waters.....		187,353		216,793		209,714
EXPORTS—Mineral and aerated waters.....		47,597		16,780		31,621

NATRO-ALUNITE

Production of natro-alunite from a deposit at Kyuquot Sound, Vancouver Island, British Columbia, amounted to 30 tons in 1921. Small shipments were made during 1922, 1923 and 1925, but in 1926 there was no production. During 1927, a shipment of 7 tons of natro-alunite valued at \$248 was made, but in 1928 no shipments were reported. The preparation of natro-alunite for the market consists in crushing, grinding and roasting; the resultant product, calcined alunite, may be used as a fertilizer because of the potash content.

Table 320.—Production of Natro-Alunite in Canada, 1921-1928

Year	Tons	Value
		\$
1921.....	30	1,500
1922.....	50	2,500
1923.....	15	750
1924.....		
1925.....	20	1,000
1926.....		
1927.....	7	248
1928.....		
Total.....	122	5,998

PHOSPHATE

The existence of the extensive Lievre river deposits of crystalline phosphate lime or apatite was first noted in 1829. However, the first commercial shipments of this mineral in Canada were made between 1870 and 1877 from North Burgess township, Ontario to a superphosphate plant at Brockville. An active market was open in Europe for raw phosphate for fertilizer purposes and this added impetus to the mining of phosphate in Ontario and Quebec. From 1878 to 1892 inclusive, the industry in Canada was at its highest point, and 296,695 tons were produced. Exports during this 15-year period totalled 281,329 tons of which quantity Great Britain received approximately 86 per cent; the United States, 8 per cent; Germany, 5 per cent; and France, Denmark, Spain and Holland, the remainder. The maximum shipment of 31,753 tons was made in 1890. Since 1899, however, the annual production has exceeded the 1,500 ton mark only once.

The discovery and opening up in the United States of the large phosphate deposits in Florida in the nineties and later of those in Tennessee caused a sharp falling-off in prices for phosphate and resulted in the closing of the large Canadian mines.

The production of Canadian phosphate since 1895 has been mainly obtained as a by-product in the mining of mica.

Activity in the phosphate industry in Canada has been practically negligible for a number of years. In 1927 shipments of phosphate rock amounting to 151 tons valued at \$1,717 were made. The 1928 production was 641 tons valued at \$8,276, and was made up of 91 tons from old mine dumps in Quebec and 550 tons extracted for experimental purposes from a deposit near Fernie, British Columbia. Imports of phosphate into Canada in 1928 came entirely from the United States and amounted to 10,388 tons appraised at \$68,266.

Table 321.—Production of Phosphate in Canada, by Provinces, 1870-1928

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1870.....			1,200	13,600	1,200	13,600
1871.....			200	2,100	200	2,100
1872-1877†.....						
1878*.....	9,919	195,831	824	12,278	10,743	208,109
1879*.....	6,604	101,470	1,842	20,565	8,446	122,035
1880*.....	11,673	175,664	1,387	14,422	13,060	190,086
1881*.....	9,497	182,339	2,471	36,117	11,968	218,456
1882*.....	16,585	302,019	568	6,338	17,153	308,357
1883*.....	19,666	427,168	50	500	19,716	427,668
1884*.....	20,946	415,350	763	8,890	21,709	424,240
1885*.....	28,535	490,331	434	5,962	28,969	496,293
1886.....	19,435	288,603	1,060	15,735	20,495	304,338
1887.....	19,589	264,452	4,101	55,363	23,690	319,815
1888.....	20,396	219,779	2,089	22,506	22,485	242,285
1889.....	27,552	287,400	3,436	29,262	30,988	316,662
1890.....	27,172	309,980	4,581	51,065	31,753	361,045
1891.....	20,244	206,416	3,344	35,187	23,588	241,603
1892.....	10,231	134,964	1,701	22,460	11,932	157,424
1893.....	7,650	60,076	240	1,886	7,890	61,962
1894.....	6,861	41,166			6,861	41,166
1895.....	1,822	9,565			1,822	9,565
1896.....	570	3,420			570	3,420
1897.....	908	3,984			908	3,984
1898.....	632	3,160	101	505	733	3,665
1899.....	1,279	7,674	1,721	10,326	3,000	18,000
1900.....	1,270	6,090	145	1,015	1,415	7,105
1901.....	1,033	6,280			1,033	6,280
1902.....	856	4,953			856	4,953
1903.....	1,329	8,214			1,329	8,214
1904.....	817	4,590			817	4,590
1905.....	1,300	8,425			1,300	8,425
1906.....	600	4,500	250	1,875	850	6,375
1907.....	408	3,410	416	2,608	824	6,018
1908.....	598	5,900	998	8,894	1,596	14,794
1909.....	625	4,800	473	3,254	998	8,054
1910.....	1,456	12,386	22	192	1,478	12,578
1911.....	586	4,909	35	297	621	5,206
1912.....	164	1,640			164	1,640
1913.....	385	3,643			385	3,643
1914.....	554	4,875	400	2,400	954	7,275
1915.....	200	2,400	17	102	217	2,502
1916.....	190	2,340	13	174	203	2,514
1917.....	123	1,230	26	256	149	1,486
1918.....	140	1,200			140	1,200
1919.....	22	300	2	31	24	331
1920.....						
1921.....	30	450			30	450
1922.....	131	1,320	59	476	190	1,796
1923.....	30	600			30	600
1924.....						
1925.....	16	189			16	189
1926.....	40	800			40	800
1927.....	31	399	82	824	(a) 151	11,717
1928.....	91	1,126			(b) 641	8,276
Total.....	300,691	4,227,780	35,051	387,465	336,330	4,622,889

*Exports:—The Quebec figures include a quantity of Ontario phosphate cleared through Montreal.

†No record of production.

(a) Includes 38 tons valued at \$494 shipped from British Columbia deposits.

(b) Includes 550 tons valued at \$7,150 shipped from British Columbia deposits.

Table 322.—Production in Canada, Imports and Exports of Phosphate, 1926-1928.

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	40	800	151	1,717	641	8,276
IMPORTS—						
Phosphate rock.....	14,244	65,607	17,485	94,758	10,388	68,266
Acid phosphate (not medicinal).....	1,999	255,020	1,557	228,433	1,632	245,518
Phosphorus.....	44	38,135	44	34,618	21	14,795
Superphosphate or acid phosphate of lime..	76,919	925,515	86,589	979,261	97,489	1,188,537
EXPORTS—Phosphate rock.....	40	800	.....	33	.....	44

PYRITES

Census returns for 1871 record a production of 2,800 tons of pyrites in Canada, made up of 2,300 tons from Quebec deposits and 500 tons from Ontario. However, it is only since 1886 that a continuous official record of pyrites production is available. Customs' records for the period 1881 to 1885 inclusive, show exports of 120,126 tons of pyrites to the United States. The 1886 output of pyrites was 42,906 tons, all of which was obtained from the Albert and Crown mines, Sherbrooke county, Quebec. In 1889, the production totalled 72,225 tons; shipments ranged from 27,687 tons to 158,566 tons during the following 24 years. The war years, 1914-1918, brought about an increased demand for sulphuric acid and a consequent advance in the production of pyrites. Shipments during this period reached a grand total of 1.6 million tons or approximately 46 per cent of the total Canadian production from 1886 to 1927. Shipments of pyrites were made during 1928 by the Consolidated Copper and Sulphur Co. (formerly Eustis Mining Company) in Quebec, the Grasselli Chemical Company in Ontario, and the Consolidated Mining and Smelting Company in British Columbia. In addition the Britannia Mining and Smelting Company Limited shipped pyrite concentrate.

It has been the practice of the Bureau in past years to report export shipments of pyrites in terms of the sulphur content of the pyrites. In view of the fact that there is now an important production of sulphur in the form of sulphuric acid made from waste bessemer gases, it has been decided to modify the method of reporting production so as to show the total sulphur content of pyrites shipped and of bessemer gases used in the manufacture of sulphuric acid. In 1928 the total sulphur content of all shipments made was 38,589 tons valued at \$321,033.

Table 323.—Production of Pyrites in Canada, 1886-1928

Year	Pyrites	Sulphur Content	Value	Year	Pyrites	Sulphur Content	Value	Year	Pyrites	Sulphur Content	Value
	tons	tons	\$		tons	tons	\$		tons	tons	\$
1886...	42,906	.....	193,077	1901...	35,261	14,457	130,544	1916...	309,251	116,975	1,084,095
1887...	38,043	.....	171,194	1902...	35,616	14,603	138,939	1917...	416,649	155,453	1,610,762
1888...	63,479	.....	285,656	1903...	33,982	13,933	127,713	1918...	411,616	154,269	1,705,219
1889...	72,225	.....	307,292	1904...	37,180	15,244	134,033	1919...	176,487	65,674	522,704
1890...	49,227	.....	123,067	1905...	33,339	13,669	125,486	1920...	174,744	67,608	719,110
1891...	67,731	25,542	203,193	1906...	42,743	17,525	169,990	1921...	33,368	12,213	116,326
1892...	59,770	26,000	173,310	1907...	46,243	18,960	212,491	1922...	18,143	6,900	74,303
1893...	58,542	22,245	175,626	1908...	47,356	19,408	224,824	1923...	28,591	11,073	113,020
1894*	40,527	16,616	121,581	1909...	64,644	26,504	222,814	1924...	23,552	9,742	95,620
1895...	34,198	14,021	102,594	1910...	53,870	22,087	187,062	1925...	15,605	7,587	58,899
1896...	33,715	13,823	101,155	1911...	82,666	33,893	365,820	1926...	17,845	8,975	63,899
1897...	38,910	15,953	116,730	1912...	81,526	33,426	314,081	1927...	50,863	25,229	198,388
1898...	32,218	13,209	128,872	1913...	158,566	65,012	521,181	1928...	68,836†	38,589	321,033
1899...	27,687	11,352	110,748	1914*	228,314	93,609	744,508				
1900...	40,031	16,413	155,164	1915...	286,038	116,157	985,190	Total	3,712,083	1,373,948	13,763,313

*Assuming an average recovery of 41% from 1894 to 1914 inclusive.

†Includes sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

‡Total sulphur content 1891-1928.

Table 324.—Production in Canada, Imports and Exports of Pyrites, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$	Pyr- ites	Sul- phur con- tent
PRODUCTION—						
Quebec.....	14,100	42,117	13,021	42,795	4,389	1,552
Ontario.....	371	4,912	463	6,077	464	*4,974
British Columbia.....	3,374	16,870	37,379	149,516	63,983	32,063
Total.....	17,845	63,899	50,863	198,388	68,836	38,589
IMPORTS—						
Brimstone or sulphur, crude or in roll or flour.....	185,625	2,945,651	177,686	2,918,047	182,343	2,962,935
EXPORTS—						
Sulphur contained in pyrites.....			13,611	105,981	31,596	249,705

*Includes sulphur content of pyrites and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

SULPHURIC ACID

Statistics collected from 6 establishments manufacturing sulphuric acid in Canada during 1928 gave the production of the commodity in terms of the standard grades of 50° Bé, 60° Bé and 66° Bé. For comparative purposes it has been deemed advisable to reduce the first two grades to their equivalent in 66° Bé acid. The production of 66° Bé sulphuric acid in Canada during 1928 totalled 96,227 tons valued at \$1,077,836. Five of the producing companies used 18,494 tons of pyrites and 18,851 tons of brimstone, while one concern used waste smelter gases.

Importations of sulphuric acid into Canada during 1928 were comparatively negligible; exports at 13,329 tons were considerably lower than in the preceding year.

Table 325.—Production, Imports and Exports of Sulphuric Acid, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Sulphur used.....	22,844	417,479	19,805	386,557	18,903	381,806
Pyrites used.....	15,986	82,708	19,379	100,374	18,494	88,889
Acid made*.....	108,230	1,306,254	98,470	1,172,507	96,227	1,077,836
IMPORTS of acid.....	53	9,245	53	8,548	55	8,652
EXPORTS of acid.....	28,136	320,324	17,407	191,926	13,329	152,544

*Expressed in terms of 66° Bé acid. Includes also the production of the Mond Nickel Co. Ltd. at Coniston, Ont., who now produce sulphuric acid from waste smelter gases.

SILICA BRICK

Silica brick is produced in Canada at Sydney, Nova Scotia, and Sault Ste. Marie, Ontario. The Nova Scotia raw material is obtained from a quarry located at Leitches Creek in Cape Breton county. In Ontario the quartz is extracted from a quarry in Deroche township, and is used in the production of refractory brick for the lining of steel furnaces.

During 1928, the total Canadian production amounted to 3,224 thousand valued at \$155,502 as against 1,791 thousand with a valuation of \$79,527 produced in 1927. The imports of silica brick during 1928 were valued at \$259,192.

SODIUM CARBONATE

The commercial deposits of natural sodium carbonate now being worked in Canada occur on the line of the Pacific Great Eastern Railway in the Clinton mining district of British Columbia, in the vicinity of 70 Mile House. Small annual shipments have been recorded from the British Columbia deposits since 1921; the maximum production, 1,120 tons valued at \$8,140, being shipped in 1925. During 1928, shipments amounted to 519 tons valued at \$4,922 as compared with 805 tons worth \$9,995 shipped in 1927.

Sodium carbonate is used largely in chemical and hydro-metallurgical plants. Its principal uses are, in the manufacture of glass, soap and paper; the bleaching and washing of linen, cotton, wool, etc., and the dyeing and printing of fabrics. Sodium carbonate has been utilized for some time as a means of removing, and of preventing the formation of boiler scale.

Soda ash from salt brine is made in Canada on a very large scale by Brunner-Mond Company, Limited, at Amherstburg, Ontario.

Table 326.—Production of Sodium Carbonate in Canada, 1921-1928

Year	Tons	Value
		\$
1921.....	197	14,775
1922.....	202	3,027
1923.....	265	3,975
1924.....	510	5,173
1925.....	1,120	8,140
1926.....	595	5,370
1927.....	805	9,995
1928.....	519	4,922
Total.....	4,213	55,377

SODIUM SULPHATE

Sodium sulphate is produced in Canada from natural deposits in Saskatchewan. The material produced may be hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate known to the trade as salt cake. It occurs as hydrous crystals or in the form of saturated brines in numerous lakes throughout Western Canada. Shipments from this source commenced in 1920 and 811 tons were produced during that year. There has been an annual production from these deposits since that date; in 1927 the total was 5,659 tons; and in 1928 a production of 6,016 tons valued at \$68,804 was recorded.

Sodium sulphate is used extensively in the pulp and paper, glass, dye and textile industries and to a smaller extent for medicinal and tanning purposes.

Importations of salt cake during 1928 were 38,835 tons worth \$445,244, glauber's salt to a total of 356 tons at \$5,386 and bisulphate of soda or nitre cake amounting to 36,561 tons at \$311,606 were also imported into Canada.

Table 327.—Production of Sodium Sulphate in Canada, 1920-1928

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	811	19,496	1925.....	3,876	19,380
1921.....	623	18,850	1926.....	6,775	13,550
1922.....	504	11,980	1927.....	5,659	11,319
1923.....	733	10,189	1928.....	6,016	68,804
1924.....	1,083	6,004			
			Total.....	26,080	179,572

Table 328.—Production in Canada and Imports of Sodium Sulphate, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Natural Sodium Sulphate—						
Crude.....	6,775	13,550	5,659	11,319	6,016	68,804
Artificial Sodium Sulphate—						
Sodium sulphate.....	2,237	31,417	375	6,624	2,160	41,042
Glauber's salt.....	1,878	39,784	2,226	45,239	2,199	45,484
IMPORTS—						
Soda, bisulphate of, or nitre cake.....	15,948	53,536	13,143	50,698	36,561	311,606
Soda, sulphate of, crude, known as salt cake.....	41,945	644,696	42,333	686,458	38,835	445,244
Glauber's salt.....	733	10,069	283	5,276	356	5,386

CHAPTER TEN

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

Including Cement, Clay and Clay Products (Brick, Drain Tile, Kaolin, Sewer Pipe, Structural Tile, Stoneware and Pottery made from Domestic Clays, Fireclay, Firebrick, Fireclay Blocks and Shapes, Imported-Clay Products), Lime, Sand and Gravel, Sand-Lime Brick, Slate, and Stone.

Production in the clay products and the other structural materials industries in Canada has increased nearly four-fold in the past twenty-one years; from a valuation of \$12,863,049 in 1907, the total for these industries rose to \$49,737,181 in 1928. This advance has been spread over all the industries included under this group. Cement production in Canada in 1887 amounted to 69,843 barrels worth \$81,909; in 1928 the total was 11,023,928 barrels valued at \$16,739,163. The value of clay products produced increased from \$1,126,057 in 1886 to \$12,381,718 in 1928. Lime shipments in 1886 were valued at \$283,755 or only 6 per cent of the 1928 value of \$4,534,568. The stone industry has also shown substantial growth; data for 1886 place the value of stone production at \$723,593, while the 1928 total was \$10,272,301. Sand and gravel production records date back no further than 1912; shipments during that year were valued at \$1,512,099 or only 26 per cent of the 1928 total of \$5,809,431.

Contracts awarded for building and construction in Canada in 1912 as reported by the *MacLean Building Review* were valued at \$463,083,000. In 1913 contract awards totalled \$384,157,000, and in the following year a decrease to \$241,952,000 was recorded. During the war period (1915-1918) construction work was largely neglected and the value of building awards remained below the 100-million-dollar mark during these years. A revival of building set in after the war, and in each year since 1920, the volume of building has been well above the 200-million-dollar mark. In 1928 the total value of building contracts awarded reached \$472,032,600, the high record mark for the building industry; surpassing the banner construction year, 1912, by about 2 per cent.

Table 329.—Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1926-1928

Province	1926	1927	1928
	\$	\$	\$
Nova Scotia.....	626,188	1,160,201	997,331
New Brunswick.....	383,233	475,365	400,140
Quebec.....	13,222,702	15,073,707	16,849,955
Ontario.....	17,650,738	19,662,038	20,438,279
Manitoba.....	2,608,110	2,373,075	3,166,797
Saskatchewan.....	359,409	574,304	809,371
Alberta.....	2,144,391	2,541,689	3,478,580
British Columbia.....	2,964,627	2,919,040	3,596,728
Canada.....	39,959,395	44,809,419	49,737,181

Table 330.—Production, Imports, Exports and Apparent Consumption of Clay Products and Other Structural Materials in Canada, 1926-1928

Item		Production	Imports	Exports	Apparent consumption
		\$	\$	\$	\$
Cement, portland.....	1926	13,031,283	96,679	358,231	12,751,731
	1927	14,391,937	105,420	308,144	14,189,213
	1928	16,739,163	177,758	340,624	16,576,297
Clay and clay products.....	1926	10,357,323	8,196,014	224,916	18,328,421
	1927	11,173,189	9,638,216	282,712	20,528,693
	1928	12,381,718	10,023,747	284,518	22,120,947
Lime.....	1926	3,781,484	42,855	344,616	3,479,723
	1927	3,923,388	70,075	367,939	3,625,524
	1928	4,534,568	64,811	357,085	4,242,294
Sand and gravel.....	1926	4,941,434	584,526	278,278	5,247,682
	1927	6,055,601	546,608	177,999	6,424,210
	1928	5,809,431	607,600	232,422	6,184,669
Slate.....	1926		218,142		218,142
	1927		208,036		208,066
	1928		239,296		239,296
Stone.....	1926	7,865,874	1,144,614	194,588	8,815,900
	1927	9,265,304	1,110,100	141,306	10,234,098
	1928	10,272,301	1,550,447	250,215	11,572,533
Total.....	1926	39,959,398	10,282,830	1,400,629	48,841,599
	1927	44,809,419	11,676,485	1,278,100	55,207,804
	1928	49,737,181	12,663,719	1,464,864	60,936,036

CEMENT

Although the first official record of the production of cement in Canada is that of the manufacture of hydraulic cement from the black limestones of Quebec in 1856, it is understood that lime and hydraulic cement were made at Hull between 1830 and 1840. The cement was manufactured from a grey argillaceous magnesian limestone obtained nearby. Plants were also operated at an early date at the mouth of the Magdalen river, Gaspé county, and in Argenteuil county, Quebec; in Ontario, at Kingston and Thorold.

It was not until 1887 that serious competition to the domestic production showed itself in large importations of Portland cement. In order to cope with this competition two Canadian manufacturers of natural cement changed their mills and processes. Canadian Portland cement made its appearance on the market in 1889. Two additional plants were constructed about this time; one at Shallow Lake, Ontario, and another at Longue Pointe, Quebec.

The period 1898 to 1905 was the scene of a boom in the construction and promotion of cement plants in Canada. Eleven marl plants were erected during these years, of which only three were really successful.

In Nova Scotia puzzolan cement was first produced from blast furnace slag and lime at Sydney in 1905. This plant was closed down in 1915, re-opened in 1920, but has been idle since 1921.

Hydraulic cement was made at the Wright plant in Hull, Quebec, between 1830 and 1840. This cement sold at prices ranging between \$1.50 and \$2.50 per barrel of 300 pounds. Only natural cement was produced at this plant until the invasion of the Canadian market by imported Portland cement necessitated the changing of the processes in order to retain the local business. In 1889, the first Portland cement produced by this concern was placed on the market. Operations were carried on until the destruction of the plant by fire in 1900.

During 1888, a small plant was erected at Pointe Claire, near Montreal; a small quantity of Portland cement was produced but the operations were not successful and were discontinued. A plant was constructed in 1889 at Longue Pointe on the bank of the St. Lawrence river, east of Montreal and early the following year shipments of Portland cement commenced. The first dry process rotary kiln used in Canada was installed at this plant in 1899. Eight years later, the Vulcan Company purchased this property and built a new mill with the most modern equipment. Operations at this plant also ceased in 1914.

The construction of the International plant at Hull was started in 1903 and within two years shipments were being made. This plant was enlarged in 1908 and the following year it became a unit in the large merger company. Owing to lack of market, because of the war, the plant was closed in 1914. Considerable work was done on the mill in 1925 and in June, 1926, operations recommenced.

A new plant was started in 1907 on the north side of the St. Lawrence river near the eastern limit of Montreal. Within two years the company was absorbed in the consolidation of thirteen plants in Canada. Very extensive alterations and additions were made to this plant, and it has been in continuous operation since 1909.

In August, 1925, the Unic plant was opened up at St. Francois de Sales, about 20 miles northeast of Montreal; operations ceased here in 1926.

The National plant at Montreal East commenced shipments in 1926.

In Ontario cement was produced at Napanee Mills (now Strathcona) in 1867. Clinker was made in kilns at this place and hauled by wagons to Napanee for grinding and packing. A new plant was constructed at Napanee Mills in 1891 for the production of Portland cement from marl and clay. Marl was transported 25 miles by rail from Marlbank and clay was obtained locally. Operations at this Strathcona mill commenced in December, 1891. During the same year a small Portland cement plant was erected at Marlbank which obtained its raw materials from Lime Lake. The following year, the Marlbank plant was opened up and operated until 1898 when it was remodelled. In 1900 the Strathcona and Marlbank plants were taken over by a new company, and three years later the Marlbank mill was enlarged and improved, with the result that, in 1904, the Strathcona mill was closed permanently. Marlbank operations continued only until 1914 and since then the plant has been dismantled.

A company was incorporated in April, 1888, for the purpose of making Portland cement at Shallow lake, Ontario. At that time the rotary kiln was a new departure in the cement industry in England and one of these kilns was purchased and put into operation at the newly erected plant. After many vicissitudes, the company was re-organized in 1902; new equipment was obtained, and operations were made commercially successful. The plant was active until 1914 but it has since been dismantled.

The Hanover plant in Ontario was built in 1898 to use marl and clay as raw materials. Marl was used at this plant until 1920 when it was replaced by limestone shipped by rail from Walkerton. In September, 1925, the mill was closed.

The Lakefield plant, in Ontario, another marl and clay proposition, was erected in 1901, and operated until 1914. This plant has been rebuilt.

Another mill was commenced in 1907 at Point Anne, near Belleville; shipments were started in the following year. Since that time the plant has been enlarged and operations have been carried on continuously.

Construction of a new plant at Port Colborne, near the lake Erie entrance to the Welland canal was started in 1907 and shipping commenced during 1908. In 1909, it became a unit of the merger company and was enlarged considerably; operations have been maintained since that date.

A departure from the dry process employed in the rock plants was instituted in 1912 when the St. Mary's mill was brought into operation using the wet process. This concern has been active during the past 14 years and is still a large producer.

Records for 1869 show two cement plants in Ontario, with an investment in plant and machinery of \$28,000, operating at Thorold and Napanee Mills and producing products valued at \$3,825. The following year these two plants employed 26 men and produced \$4,950 worth of products. In 1871 employment was furnished 28 men and the value of the mill output was \$11,700. The growth of the industry through the natural cement stage to the final concentration of the producers on the manufacture of Portland cement may be traced by the inception and subsequent disappearance of many companies. An idea of the magnitude of the industry can be obtained by a glance at the data for 1913 after consulting the figures for the earlier years, and then comparing these with the statistics for 1925 and 1927. In 1913 the 14 Ontario plants

with a production of 3,992,998 barrels, employed 1,382 men earning \$955,729, and in 1925 the 4 plants operating produced 3,462,358 barrels at \$5,253,911, employed 749 men whose wages totalled \$1,018,915. Incidentally the capital actually employed in 1925 was \$12,513,281. During 1927 four plants were operated, their locations being Belleville, Port Colborne, Lakefield and St. Mary's. The production amounted to 3,751,786 barrels with a valuation of \$5,144,326.

Cement production in Manitoba started with the manufacture of the natural product. The first plant was built at Arnold but the operations here ceased years ago. Babcock, a few miles from Arnold, was the site for another mill which was constructed in 1906. This plant is still active. The construction of a plant at Tuxedo (Fort Whyte) 9 miles southwest of Winnipeg was started in 1911. For two years this plant used clinker produced near Belleville, Ontario. Since 1913 this mill has been using limestone obtained from a quarry at Steep Rock on the east shore of Lake Manitoba, 145 miles north of Winnipeg.

Plants were erected at Calgary and Exshaw, Alberta, in 1906 and 1907. Raw materials for the former mill consisted of limestone hauled by rail from The Gap, some 60 miles west and shale from Sandstone, 20 miles south. The Exshaw mill, located 60 miles west of Calgary, uses limestone from a deposit close to the plant and shale which is transported by rail three miles from Kananaskis. In 1914 the Calgary mill was closed down and it has since been dismantled. A dry process plant was erected at Blairmore in 1909; it changed hands in 1919 but owing to insufficient demand for cement in the district, the plant has remained idle since that date.

A marl plant was built in 1912, at Marlboro about 140 miles west of Edmonton. Five years later a change was made to dry process, using limestone obtained from the mountains to the west, and local clay. Shipments have been made annually from this plant since 1917.

Work was commenced on a new plant at Medicine Hat in 1913 but the construction had not been completed before the outbreak of war in 1914 and the changed conditions caused the suspension of further work on this building.

The Canadian Pacific Railway Company was the first to attempt to manufacture cement in British Columbia. About the year 1891 this company started the replacement, on a large scale, of the original wooden structures on the mountain section of its line, using in this work large quantities of masonry. The cement required was very costly, as it was all brought from England in sailing vessels which had to make the long, slow trip around Cape Horn. In an effort to reduce this cost the company decided to investigate the possibility of making cement at or near Vancouver, and for this purpose brought out from the Isle of Wight an experienced cement maker and chemist, who, after examining various materials available, made a favourable report, and, in 1893, was commissioned to build a small plant on a site selected on the water front at Vancouver. Limestone was brought by barge from Texada island, about forty miles northwest of Vancouver, clay by rail from a cutting about thirty miles east, and coal by barge from the Dunsmuir mines on Vancouver island. The limestone was burned in simple kilns and then mixed with clay and water to form a slurry which was dried on a floor of iron plates with fires underneath. The dried slurry was burned in upright kilns and the clinker was ground by burr stones. The cement is said to have been of excellent quality and was used in thousands of yards of masonry which is still in good condition. This plant was in operation about ten years, after which it was dismantled.

In 1904, the Vancouver Portland Cement Company, Limited, built a rotary kiln plant at Tod Inlet on Vancouver island, and in 1912 the Associated Portland Cement Company (Canada), Limited, erected a similar plant at Bamberton, B.C. In 1916, these companies were united under the name of The British Columbia Cement Company, Limited.

In 1912, another plant was built near Princeton but the company operating it went into liquidation in 1914 and the plant has since been dismantled.

Cement production in Canada during 1928 established a new high record at 11,023,928 barrels valued at \$16,739,163, marking an advance of 9.5 per cent in quantity and 16.3 per cent in value over the 1927 shipments of 10,065,865 barrels worth \$14,391,937.

The total Canadian output was obtained from plants in Quebec, Ontario, Manitoba, Alberta and British Columbia. Quebec mills accounted for 44.6 per cent of the total Canadian production; Ontario mills contributed 35.5 per cent of the total. Alberta's production advanced 38.6 per cent during the year; sales in Manitoba increased 25.7 per cent and in British Columbia, 28.0 per cent.

The average selling price per barrel, f.o.b. plant, in each province, was as follows: Quebec, \$1.28; Ontario, \$1.41; Manitoba, \$2.43; Alberta, \$2.08; and British Columbia, \$2.23.

Imports of Portland cement into Canada during 1928 totalled 34,047 barrels averaging \$4.29 per barrel; in 1927 the average value was \$4.52 per barrel. Portland cement exports were recorded at 267,325 barrels valued at \$340,624. The supply of cement made available for consumption in Canada in 1928 was the greatest on record and amounted to 10,790,650 barrels.

Table 331.—Production of Cement in Canada, 1887-1928

Year	Barrels	Value	Year	Barrels	Value	Year	Barrels	Value
		\$			\$			\$
1887.....	69,843	81,909	1902.....	722,525	1,127,550	1917.....	4,768,488	7,724,246
1888.....	50,668	35,593	1903.....	719,993	1,225,247	1918.....	3,591,481	7,076,503
1889.....	90,474	69,790	1904.....	967,172	1,338,239	1919.....	4,995,257	9,802,433
1890.....	102,216	92,405	1905.....	1,360,732	1,924,014	1920.....	6,651,980	14,798,070
1891.....	93,479	108,561	1906.....	2,128,374	3,170,859	1921.....	5,752,885	14,195,143
1892.....	117,408	147,663	1907.....	2,441,868	3,781,371	1922.....	6,943,972	15,438,481
1893.....	158,597	194,015	1908.....	2,666,333	3,709,954	1923.....	7,543,589	15,064,661
1894.....	108,142	144,637	1909.....	4,067,709	5,345,802	1924.....	7,498,624	13,398,411
1895.....	128,294	173,675	1910.....	4,753,975	6,412,215	1925.....	8,116,597	14,046,704
1896.....	149,090	201,651	1911.....	5,692,915	7,644,937	1926.....	8,707,021	13,013,283
1897.....	205,213	275,273	1912.....	7,132,732	9,106,556	1927.....	10,065,865	14,391,937
1898.....	250,209	397,580	1913.....	8,658,805	11,019,418	1928.....	11,023,928	16,739,163
1899.....	396,753	633,291	1914.....	7,172,480	9,187,924			
1900.....	417,552	662,910	1915.....	5,681,032	6,977,024			
1901.....	450,394	660,030	1916.....	5,369,560	6,547,728	Total.....	147,984,224	238,686,856

Table 332.—Output, Sales, Imports, Exports and Consumption of Cement in Canada, 1926-1928

	1926		1927		1928	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
OUTPUT.....	9,041,411		9,927,163		11,076,659	
SOLD OR USED.....	8,707,021	13,013,283	10,065,865	14,391,947	11,023,928	16,739,163
STOCKS DEC. 31.....	1,609,313		1,470,611		1,520,583	
IMPORTS—						
Portland cement.....	21,114	77,866	19,354	87,541	34,047	146,164
Manufactures.....		18,813		17,879		31,594
EXPORTS.....	285,932	358,231	249,694	308,144	267,325	340,624
APPARENT CONSUMPTION.....	8,442,203		9,835,525		10,790,650	

Table 333.—Sales of Cement in Canada, by Provinces, 1926-1928

Province	1926		1927		1928	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
Quebec.....	3,727,377	4,535,386	4,636,751	5,383,058	4,913,820	6,305,396
Ontario.....	3,398,860	4,792,857	3,751,786	5,144,326	3,911,795	5,520,897
Manitoba.....	612,155	1,572,401	551,698	1,378,121	693,450	1,685,084
Alberta.....	423,766	873,621	601,699	1,363,880	834,067	1,732,582
British Columbia.....	544,863	1,239,018	523,931	1,182,552	670,796	1,495,204
Canada.....	8,707,021	13,013,283	10,065,865	14,391,937	11,023,928	16,739,163

Table 334.—Capital Employed in the Cement Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	34,495,477	35,365,970
Cost of supplies and stocks on hand.....	3,114,415	4,020,658
Cash, trading and operating accounts and bills receivable.....	2,899,427	8,292,213
Total.....	40,509,319	47,678,841

Table 335.—Employees, Salaries and Wages in the Cement Industry in Canada, 1927 and 1928

Class	1927		1928	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
SALARIED EMPLOYEES.....	125	270,328	122	256,867
WAGE-EARNERS.....	2,145	2,873,604	2,285	3,148,518
Total.....	2,270	3,143,932	2,407	3,405,385

Table 336.—Wage-Earners in the Cement Industry in Canada, by Months, 1927 and 1928

Month	1927	1928	Month	1927	1928
January.....	1,735	1,867	July.....	2,545	2,433
February.....	1,748	1,941	August.....	2,548	2,423
March.....	1,711	2,030	September.....	2,554	2,383
April.....	1,854	2,156	October.....	2,128	2,311
May.....	2,143	2,412	November.....	2,160	2,356
June.....	2,319	2,468	December.....	2,087	2,263

CLAY AND CLAY PRODUCTS

Under "Clay and Clay Products" there have been included statistics relating to production in Canada from domestic clays, of (a) fireclay; (b) fireclay blocks and shapes; (c) firebrick; (d) brick made by the different processes, such as the soft mud process, stiff mud process and dry press; (e) structural tile, such as hollow blocks, roofing tile, floor tile (quarries), and ceramic or glazed floor and wall tile; (f) drain tile; (g) sewer pipe, including copings, flue linings, etc., and (h) pottery.

The clay products industry has been carried on in Canada for many years; census records for 1871 show 426 brick and tile producers in Canada, employing 3,073 workers whose wages totalled \$399,698. The value of products made in that year was \$925,235. Corresponding with the growth of the country, ten years later the number of plants in operation had risen to 560, with a payroll of 4,129 employees, wages amounting to \$608,690 and a production value of \$1,541,-892. Statistics for 1886, record 261 brick and 82 tile plants in operation with a total output valued at \$1,016,217. Building brick (common and pressed) was produced in increasing quantities from the beginning of the century; 1900 recorded a valuation of \$2,275,000 while in 1906, the sum of \$4,102,590 was realized from the sale of these products. Almost similar conditions applied to the activities of the plants producing other clay products.

In 1920, the 223 operators reported sales aggregating in value, \$10,664,929; wage-earners numbered 5,212, and the outlay for wages was \$5,053,837. In 1928, the 177 operators produced clay products valued at \$12,381,718, an increase of 10·8 per cent over the total for 1927. Ontario producers accounted for 49·9 per cent of the Canadian total and Quebec operators 25·0 per cent. In order of their relative clay products sales the other producing provinces were: Alberta, British Columbia, Nova Scotia, Saskatchewan, Manitoba and New Brunswick.

Imports of clay and clay products into Canada in 1928 were valued at \$10,023,747, including imports from Great Britain valued at \$3,910,376; from the United States, \$4,179,331; from Germany; \$594,846; from France, \$384,253; from Japan \$381,860; from Czechoslovakia, \$377,762; from Belgium, \$116,041; minor amounts were also received from 21 other countries. Exports of clay and clay products from Canada during 1928 were valued at \$284,518.

Brick.—Common and pressed brick produced in Canada during 1886 had a value of \$873,600; the plants in operation were located in Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, North West Territories and British Columbia. Progress in the brick industry was recorded during the succeeding twenty years and in 1906 the value of common and pressed brick produced reached a total of \$4,102,590. In the following year, data were obtained segregating the production of these two classes of brick: 439,016,000 common brick valued at \$3,455,524 and 78,922,000 pressed brick worth \$794,722 were shipped during 1907.

Common brick production reached its highest point in 1912 when 769,192,000 at an average value of \$9.11 per thousand, were shipped. During the same year pressed brick production established a record at 125,180,000 with an average value of \$12.86 per thousand. Since 1917, the value per thousand has never fallen as low as the average price in 1912.

Paving brick production in Canada was first recorded in 1897 when 4,568,000 were shipped by plants at Toronto, Ontario. During the period 1899-1907, the average annual production was 3,917,000. Prior to 1914 the total Canadian output of paving brick came from West Toronto, Ontario, where shale from the banks of the Humber river was used. In 1914, 1915 and 1916 the Clayburn plant in British Columbia produced a small quantity. In 1916 a plant at Edmonton, Alberta, produced a small quantity of paving brick. During the succeeding five years there was no production, but in 1922, the Clayburn plant shipped 151,000. Production ceased until 1926, when the British Columbia plant made shipments of 122,000 paving brick. In the following year a small shipment was made from this plant. The 1928 shipments consisted of 301,000 from a Quebec plant, and 37,000 from the Clayburn plant.

Stoneware and Pottery from Domestic Clays.—Records for 1888 show shipments of pottery from Canadian plants valued at \$27,750; within the next four years the production had increased to nearly ten times that value. Production thereafter varied but remained above the \$100,000 mark each year up to the end of 1911. From 1912 to 1916, values ranged between \$35,371 and \$64,900. During the following years a considerable improvement was shown in annual sales and in 1928 a record valuation of \$356,093 was set up.

Four plants with total assets of \$401,255 were engaged primarily in the production of stoneware and pottery from Canadian clays in 1928. Employees in the industry totalled 161 persons whose earnings were \$175,087.

In New Brunswick, a plant at Saint John produces stoneware, Rockingham ware and flower pots from Canadian clay. Flower pots are produced from local clays at Toronto and Hamilton, Ontario. Rockingham ware and flower pots are produced at Medicine Hat, Alberta.

Fireclay.—Clays from the Drummond colliery at Westville, Nova Scotia, and from Flower Cove, New Brunswick, are used for the manufacture of refractory products.

In Quebec, the discoloured portions of the kaolin found at St. Remi d'Amherst can be utilized as a fireclay.

In the valleys of the Abitibi, Mattagami and Missinaibi rivers, which flow northward on the James bay slope, in Ontario, the occurrence of residual deposits of refractory clays has been known for many years. The extension of the Temiskaming and Northern Ontario railway from Cochrane to Oil Can Portage on the Abitibi river has brought an important deposit within 30 miles of shipping facilities.

In Manitoba, semi-refractory shale is found in Turtle Mountain, at La Riviere and near Virden in the Assiniboine valley.

Refractory and semi-refractory clays occur in southern Saskatchewan. At Claybank, in the Dirt hills, south of Moose Jaw, standard fire brick, special shapes and face brick, are made from local clays. Similar clays are found near Michellton at Willows, south of Twelve Mile lake, and along the Frenchman river valley in the Cypress hills.

Along the Athabaska river near Fort McMurray, refractory and semi-refractory clays are found associated with the tar sands.

A very important deposit of fireclay occurs in Sumas mountain, about 40 miles eastward from Vancouver, British Columbia; at Clayburn refractory products are made from this clay. Refractory shales also occur near Whonnock and a residual fireclay deposit at Kyuquot, Vancouver Island, is operated; the clay is shipped to Victoria for the manufacture of stove linings and sewer pipe.

In 1889, the first production of fireclay in Canada was recorded, namely, 400 tons valued at \$4,800. The maximum production for the industry, in point of tonnage, was reached in 1917 when 10,534 tons were shipped. During 1928, total shipments from Nova Scotia, New Brunswick, Saskatchewan and British Columbia amounted to 5,123 tons valued at \$35,284. Imports of fireclay into Canada in 1928 totalled 60,958 tons evaluated at \$266,320.

Firebrick.—Firebrick production in Canada from domestic clays reached its highest point in 1917 when 8,192,000 were produced with an average selling value of \$24.31 per thousand. Although sales have been smaller during the following years, higher prices prevailed and thus the 1917 aggregate valuation has been exceeded annually. During 1928 Nova Scotia, Saskatchewan, Alberta and British Columbia plants shipped 4,940,000 firebrick valued at \$234,460.

Fireclay Blocks and Shapes.—Plants in Nova Scotia, New Brunswick, Saskatchewan, and British Columbia produce special fireclay blocks and shapes from domestic clays. In 1907 the output of this class of refractory products was valued at \$18,000. Production increased until in 1918 a record for the industry was set up when shipments to a value of \$111,589 were made. The 1928 production had a sales value of \$105,091.

Three plants in Canada, located at Montreal, St. Johns, and Toronto, produce special refractory blocks and shapes from imported clays.

Drain Tile.—Data regarding the production of drain tile in Canada are available since 1891. From information obtained by the *Ontario Department of Mines*, production during that year was valued at \$90,000. Ten years later production had increased until a valuation of \$250,000 was reached. During 1928, drain tile shipments totalled 22,629,000 valued at \$656,054, a new high record for the industry in Canada.

Kaolin.—Deposits of kaolin at St. Remi d'Amherst were first noted by the Geological Survey in 1894. Two years later samples were shipped to porcelain plants at Trenton, New Jersey, but it was not until 1911 that any serious attempt was made to develop this property. Production commenced in 1912, when 20 tons were shipped. Increases were recorded annually until the maximum production of 1,750 tons for the industry was reached in 1916. Shipments continued up to 1923, in which year, 163 tons were sold. No commercial shipments of kaolin have been made from Canadian deposits since 1923. During 1927 and 1928 small shipments were made from the St. Remi d'Amherst deposit for testing purposes.

Some development work was done during 1925 and 1926 on the china clay deposits on the Mattagami river, near Long Falls, Temiskaming district, Ontario.

Other Clays.—A shipment of 30 tons of bentonite valued at \$150 was made in 1926 from Princeton, British Columbia; in 1928, a further shipment of 20 tons was made. During 1926 development work was done near Williams lake, British Columbia, on a deposit of a refractory material known locally as kaolin but described merely as "silicate of alumina" by the Provincial Mineralogist; 129 tons value at \$1,900 were produced. This material was shipped to Vancouver, British Columbia, where some was used in the manufacture of plastic firebrick and refractory cements, and some directly as fireclay. Some small shipments of white ball clay have been made to the United States from Saskatchewan deposits.

Sewer Pipe.—Records of sewer pipe production in Canada date back to 1888 when shipments of this commodity were valued at \$266,320. Production during the succeeding years varied considerably until in 1907 a valuation of \$667,100 was recorded. Seven years later, 1914, the sewer pipe production was valued at \$1,104,499. In 1922, the high mark for the industry was reached when sewer pipe to a value of \$1,766,347 was shipped from Nova Scotia, Quebec, Ontario, Alberta and British Columbia plants. The total capital employed in these plants was \$3,057,149 and employment was afforded 448 persons who received \$547,411 in salaries and wages. Sewer pipe, copings and flue linings shipped in 1928 were valued at \$1,723,644.

Structural Tile.—Records of the production of structural tile in Canada include such items as hollow blocks (fireproofing and load-bearing tile), roofing tile, and floor tile. Hollow blocks are produced in every province except Prince Edward Island and New Brunswick. Roofing and floor tile are made in Ontario. The total production of structural tile in Canada during 1928 was valued at \$1,982,316 as compared with a value of \$1,463,840 in the previous year.

In this section all tables except Table 339 show data for domestic clay products only.

Table 337.—Production of Clay Products in Canada from Domestic Clays by Provinces, 1886–1928

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1886.....	13,120	50,630	33,218	83,025	881,039	14,475	9,400	41,150	1,126,057	
1887.....	9,145	43,746	46,541	80,117	1,187,453	8,125	4,300	19,480	1,395,907	
1888.....	9,900	56,995	34,364	223,161	1,123,671	2,400	1,650	42,532	1,494,673	
1889.....	6,504	...	93,425	278,845	1,182,397	19,636	9,210	62,317	1,652,334	
1890.....	11,775	60,520	70,430	458,597	1,347,278	15,300	10,000	67,201	2,041,101	
1891.....	8,220	54,755	47,071	500,957	1,076,154	13,300	23,000	79,475	1,802,932	
1892.....	6,536	93,611	52,853	489,470	1,313,877	67,450	24,937	129,234	2,177,963	
1893*.....									2,619,590	
1894*.....									2,560,236	
1895*.....									2,487,248	
1896*.....									2,227,962	
1897*.....									2,325,903	
1898.....	†	173,280	113,400	820,758	1,449,536	34,000		100,000	2,696,974	
1899.....	†	110,695	85,600	828,868	1,828,936	25,000		109,000	2,985,099	
1900.....	†	108,210	80,920	866,060	2,009,915	25,000		105,000	3,195,105	
1901.....	†	103,695	50,229	884,166	2,222,620	20,000		101,996	3,382,706	
1902.....	†	152,025	150,945	946,755	2,149,451		150,000	76,313	3,625,489	
1903.....	†	150,100	150,675	1,028,246	2,402,520		150,000	152,748	4,034,289	
1904.....	†	157,762	150,830	917,894	2,306,200		150,000	158,874	3,841,560	
1905.....	†	90,146	45,010	896,000	2,696,500	588,735	103,278	191,287	98,886	4,709,842
1906.....		160,506	49,220	769,458	3,136,870	517,065	136,022	180,217	123,277	5,072,635
1907.....		125,560	57,377	1,214,108	3,123,372	466,432	125,459	353,672	306,137	5,772,117
1908.....		117,833	75,513	893,717	2,476,152	265,091	87,566	240,384	344,446	4,500,702
1909.....		188,185	65,570	1,153,832	3,425,841	559,008	145,516	442,486	470,402	6,450,840
1910.....		204,782	56,475	1,442,842	3,667,810	781,605	160,850	753,232	562,360	7,629,956
1911.....		274,249	38,000	1,341,467	3,916,575	834,428	226,958	1,052,751	675,505	8,359,933
1912.....		272,053	54,910	1,680,460	4,864,700	1,018,051	332,943	1,356,184	996,568	10,575,869
1913.....		332,272	62,269	1,606,816	5,220,467	514,358	189,820	893,408	684,904	9,504,314
1914.....		266,204	66,502	1,267,700	3,979,606	317,488	98,349	462,199	413,909	6,871,957
1915.....		221,881	35,780	918,425	2,254,863	93,674	44,406	115,696	229,763	3,914,488
1916.....		238,470	42,881	993,664	2,145,036	104,248	78,668	225,140	292,698	4,120,805
1917.....		331,542	51,304	983,310	2,575,304	114,651	78,251	309,991	334,685	4,779,035
1918.....		303,515	39,055	817,357	2,434,215	116,417	133,935	381,074	357,921	4,583,489
1919.....		432,900	52,941	1,577,576	4,574,796	131,737	270,989	571,949	293,478	7,906,366
1920.....		541,114	73,484	2,376,029	5,613,488	206,764	471,448	786,430	596,172	10,664,929
1921.....		361,761	66,600	1,744,760	5,183,125	208,982	166,244	710,477	415,869	8,857,813
1922.....	3,975	427,643	75,425	2,494,236	6,944,218	210,740	134,704	700,063	447,452	11,438,456
1923.....		413,974	62,587	2,439,598	6,270,615	160,134	119,405	590,565	426,138	10,483,016
1924.....	3,340	355,948	74,994	2,435,695	5,089,299	117,450	137,280	540,477	460,594	9,215,077
1925.....	3,020	422,690	69,473	2,426,887	5,195,084	173,794	95,952	618,860	523,931	9,529,691
1926.....		362,667	75,851	2,702,298	5,356,469	248,497	214,113	804,933	592,495	10,357,323
1927.....		416,417	87,185	2,734,738	5,853,035	201,464	311,204	889,353	679,788	11,173,189
1928.....		496,577	72,192	3,097,295	6,177,664	291,791	377,896	1,162,264	706,039	12,381,715
Total.....										236,526,701

*Data by provinces not available.

†Included with Nova Scotia.

Table 338.—Production of Clay Products in Canada, from Domestic Clays, by Provinces, 1926-1928

Province	1926		1927		1928	
	Sold or used	Per cent of total value	Sold or used	Per cent of total value	Sold or used	Per cent of total value
	\$		\$		\$	
Nova Scotia.....	362,667	3.50	416,417	3.73	496,577	4.01
New Brunswick.....	75,851	0.73	87,185	0.78	72,192	0.58
Quebec.....	2,702,298	26.09	2,734,738	24.48	3,097,295	25.02
Manitoba.....	5,356,469	51.72	5,853,035	52.38	6,177,664	48.89
Saskatchewan.....	248,497	2.40	201,464	1.80	291,791	2.36
Alberta.....	214,113	2.07	311,204	2.79	377,896	3.05
British Columbia.....	804,933	7.77	889,358	7.96	1,162,264	9.39
	592,495	5.72	679,788	6.08	706,039	5.70
Canada.....	10,357,323	100.00	11,173,189	100.00	12,381,718	100.00

Table 339.—Value of Clay Products Produced in Canada from Domestic and from Imported Clays, 1927 and 1928

Product	From domestic clays		From imported clays		Total	
	1927	1928	1927	1928	1927	1928
	\$	\$	\$	\$	\$	\$
Fireclay blocks and shapes.....	100,659	105,091	331,000	313,637	431,659	418,728
Sanitary ware.....			422,447	520,871	422,447	520,871
Ceramic or glazed floor and wall tile.....			137,488	133,411	137,488	133,411
Pottery, glazed and unglazed.....	307,057	356,093	42,491	38,144	349,548	394,237
Electrical porcelain insulators.....			1,025,224	1,321,556	1,025,224	1,321,556
Other clay products (brick, tile, sewer pipe, etc.).....	10,765,473	11,920,534	129,588	131,182	10,895,061	12,051,716
Total.....	11,173,189	12,381,718	2,088,238	2,458,801	13,261,427	14,840,519

Table 340.—Production in Canada, Imports and Exports of Clay and Clay Products, 1926–1928

Kind	1926		1927		1928	
	Quantity	Total selling value	Quantity	Total selling value	Quantity	Total selling value
		\$		\$		\$
PRODUCTION—						
Brick: Soft mud process (Face..... M	28,235	556,573	16,196	325,966	17,532	349,847
Common.. M	78,158	1,145,490	70,554	1,091,274	93,280	1,328,981
Stiff mud process (Face..... M	101,028	2,146,362	95,480	2,024,064	101,717	2,247,472
(wire cut) Common.. M	94,046	1,624,055	150,222	2,239,180	144,404	2,182,307
Dry press (Face..... M	30,423	651,236	39,753	833,570	36,587	748,301
Common..... M	19,450	260,598	14,617	187,062	24,294	337,096
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)..... M	462	24,057	620	29,372	599	28,763
Sewer brick..... M	6,546	117,194	10,997	210,643	2,888	59,010
Paving brick..... M	122	5,015	50	2,106	338	4,464
Firebrick from domestic clay M	4,195	192,276	5,388	246,266	4,940	234,460
Fireclay..... tons	2,513	23,258	5,070	35,961	5,123	35,284
Kaolin.....			24	120	5	25
Bentonite..... tons	30	150			20	100
Fireclay blocks and shapes.....		54,064		100,659		105,091
Structural tile:—						
Hollow blocks (including fireproofing and load-bearing tile)..... tons	142,061	1,314,650	151,307	1,431,141	205,257	1,930,152
Roofing tile..... No.	17,018	1,562	2,000	140	72,930	6,435
Floor tile (quarries)..... Sq. ft.	195,011	43,854	135,285	32,559	171,520	45,729
Drain tile..... M	14,258	396,018	22,259	598,098	22,629	656,054
Sewer pipe (including copings, flue linings, etc.)..... tons	75,996	1,480,776	77,262	1,475,875		1,723,644
Pottery, glazed or unglazed.....		320,135		307,057		356,093
Other products.....				2,076		2,410
Total.....		10,357,323		11,173,189		12,381,718
IMPORTS—						
Bath brick.....		97				
Building brick..... M	4,157	93,337	6,672	142,438	14,513	246,723
Building blocks.....		77,230		42,365		58,016
Clays—						
China..... cwt.	360,546	200,902	420,822	235,824	462,357	262,207
Fire..... cwt.	937,487	193,741	984,526	219,500	1,219,155	266,320
Pipe.....		1,323		2,258		794
Zirconium silicate.....		2,704		2,548		2,450
Other clays.....		81,253		90,153		93,663
Drain tile, unglazed.....		2,547		2,059		556
Drain sewer pipe and earthenware fittings therefor, chimney linings or vents chimney tops or inverted blocks, glazed or unglazed.....		65,487		77,274		103,506
Insulators, electric, porcelain.....		305,774		437,328		510,008
Earthenware and chinaware.....		4,647,395		5,549,327		5,418,017
Brick, fire, other, valued at not less than \$100 per M, rectangular shaped: the dimensions of each not to exceed 125 cubic inches for use exclusively in the construction or repair of a furnace, kiln, etc.....		41,690		20,634		38,327
Brick, fire, n.o.p., for use exclusively in the construction or repair of a furnace, kiln or other equipment of a manufacturing establishment.....		1,023,850		1,152,277		1,217,003
Firebrick, n.o.p.....		156,781		121,343		117,539
Firebrick, chrome.....		50,203		52,565		56,375
Magnesite brick.....		66,429		118,457		140,944
Silica brick.....		263,293		329,214		259,192
Paving brick..... M	2,678	72,989	2,051	54,561	3,431	88,943
Other clay manufactures.....		848,989		988,061		1,143,164
Total.....		8,196,014		9,638,216		10,023,747
EXPORTS—						
Building brick..... M	1,845	25,908	1,450	23,059	3,034	46,037
Clay—						
Unmanufactured..... cwt.	14,537	3,898	15,454	2,940	19,903	20,577
Manufactures.....		61,523		86,746		76,529
Earthenware.....		12,764		14,771		17,235
Porcelain insulators.....		120,823		155,196		124,140
Total.....		224,916		282,712		284,518

Table 341.—Production of Building Brick in Canada by Provinces, 1926-1928

		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1926									
Soft mud process.	Face.....	M 10		7,836	20,389				
	Common.....	\$ 200		196,829	359,544				
Stiff mud process (wire cut).	Face.....	\$ 826		25,833	35,474	9,775	765	2,022	3,463
	Common.....	\$ 10,670		365,405	522,803	159,350	11,240	24,458	51,564
Dry press	Face.....	\$ 1,262		17,156	76,078	3,181	1,252	951	1,148
	Common.....	\$ 25,139		442,738	1,537,450	45,778	35,365	21,111	38,781
Fancy or ornamental brick.	Face.....	\$ 3,845	2,372	68,131	12,110	105	2,728	4,271	484
	Common.....	\$ 50,002	34,258	1,247,875	206,242	1,050	31,428	45,208	7,992
Sewer brick.....	Face.....	\$			26,462		593	2,070	1,298
	Common.....	\$			539,854		21,422	39,064	50,896
Total.....	Face.....	\$			3,055		159	13,236	3,000
	Common.....	\$			39,689		2,138	164,771	54,000
Total.....	Face.....	\$		88	374				
	Common.....	\$		4,010	20,047				
Total.....	Face.....	\$			6,397				149
	Common.....	\$			111,620				5,574
1927									
Soft mud process.	Face.....	M 35		83	16,078				
	Common.....	\$ 735		1,243	323,988				
Stiff mud process (wire cut).	Face.....	\$ 972	2,885	6,167	44,882	1,132	863	2,305	11,348
	Common.....	\$ 12,893	44,100	63,353	740,664	18,100	10,592	28,461	173,111
Dry press	Face.....	\$ 1,345		24,762	65,894	143	1,419	1,545	372
	Common.....	\$ 31,068		577,348	1,321,604	3,800	42,711	35,613	11,920
Fancy or ornamental brick.	Face.....	\$ 3,887		106,341	21,177	7,391	5,709	5,619	98
	Common.....	\$ 47,549		1,627,330	310,344	122,019	66,654	62,892	2,392
Sewer brick.....	Face.....	\$		2,134	32,699	947	576	2,448	949
	Common.....	\$		63,047	641,903	21,921	19,197	48,467	39,035
Total.....	Face.....	\$		1,147	12,716			13,470	
	Common.....	\$		101	519			174,346	
Total.....	Face.....	\$		4,356	25,016				
	Common.....	\$		10,760	202,920				237
Total.....	Face.....	\$							7,723
	Common.....	\$							
1928									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1929									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1930									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1931									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1932									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1933									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1934									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
Fancy or ornamental brick.	Face.....	\$ 6,137		99,014	23,711		9,981	3,479	2,082
	Common.....	\$ 77,193		1,542,576	383,687		114,106	33,352	31,393
Sewer brick.....	Face.....	\$		2,492	29,182		432	4,481	
	Common.....	\$		66,842	581,609		12,426	87,424	
Total.....	Face.....	\$		52	3,460	328		17,593	2,861
	Common.....	\$		511	43,753	4,945		243,039	44,848
Total.....	Face.....	\$		67	532				
	Common.....	\$		3,049	25,714				
Total.....	Face.....	\$			2,621				
	Common.....	\$			49,547				
1935									
Soft mud process.	Face.....	M 185	50	70	16,327			662	238
	Common.....	\$ 2,220	1,000	1,115	317,800			22,163	5,549
Stiff mud process (wire cut).	Face.....	\$ 1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	Common.....	\$ 13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Dry press	Face.....	\$ 1,510		29,914	64,664	2,014	1,374	845	1,396
	Common.....	\$ 34,639		686,752	1,367,859	42,350	44,208	17,927	53,737</

Table 342.—Production of Building Brick (Common and Pressed) in Canada, 1886-1923

Year	Common and Pressed*		Year	Common		Pressed		Total	
	Quantity	Value		Quantity	Value	Quantity	Value	Quantity	Value
	M	\$		M	\$	M	\$	M	\$
1886		873,600	1907	439,016	3,455,524	78,922	794,722	517,938	4,250,246
1887		986,689	1908	353,261	2,611,554	53,481	517,180	406,742	3,128,734
1888		1,036,746	1909	539,229	4,212,424	57,265	630,677	596,494	4,843,101
1889		1,273,884	1910	627,715	5,105,354	67,895	807,294	695,610	5,912,648
1890		1,266,982	1911	645,551	5,420,890	87,351	1,094,582	732,902	6,515,472
1891		1,061,536	1912	769,192	7,010,375	125,180	1,609,854	894,372	8,620,229
1892		1,251,934	1913	668,427	5,917,373	116,802	1,458,733	785,229	7,376,106
1893		1,800,000	1914	457,514	3,653,861	93,635	1,115,556	551,149	4,769,417
1894		1,800,000	1915	234,733	1,755,187	49,817	492,774	284,550	2,247,961
1895		1,670,000	1916	237,035	1,826,844	44,947	492,355	281,982	2,319,199
1896		1,600,000	1917	210,631	1,999,465	46,409	653,153	257,040	2,652,618
1897		1,600,000	1918	164,970	1,879,811	40,147	639,083	205,117	2,518,894
1898		1,900,000	1919	291,470	3,850,219	74,424	1,304,162	365,894	5,154,381
1899		2,195,000	1920	303,343	4,855,996	85,137	2,004,537	388,486	6,840,533
1900		2,275,000	1921	220,438	3,507,503	80,947	1,738,293	301,385	5,305,796
1901		2,400,000	1922	294,919	4,714,658	90,578	1,839,549	385,497	6,554,207
1902		2,593,000	1923	250,565	3,884,474	73,400	1,461,483	323,965	5,345,957
1903		2,832,000							
1904		2,983,000	Total						125,791,385
1905	523,820	3,933,925							
1906	523,390	4,102,590							

* Separate statistics not available till 1907.

Table 343.—Production of Building Brick in Canada, 1924-1928

		Soft mud process		Stiff mud process (wire cut)		Dry Press		Fancy or ornamental brick	Sewer brick	Total
		Face	Common	Face	Common	Face	Common			
1924	M	10,831	50,079	80,565	124,556	35,203	12,794	755	2,690	317,473
	\$	185,248	746,044	1,842,224	1,880,631	761,572	168,043	98,460	40,775	5,722,997
1925	M	27,701	51,214	93,903	116,105	37,201	22,053	524	2,485	351,186
	\$	521,739	753,970	1,883,856	1,635,257	800,504	270,135	26,320	52,382	5,944,163
1926	M	28,235	73,158	101,028	94,046	30,423	19,450	462	6,546	358,348
	\$	556,573	1,145,490	2,146,362	1,624,055	651,236	260,598	24,057	117,194	6,525,565
1927	M	16,196	70,554	95,480	150,222	39,753	14,617	620	10,997	398,439
	\$	325,966	1,091,274	2,024,064	2,239,180	833,570	187,062	29,372	210,643	6,941,131
1928	M	17,532	93,280	101,717	144,404	36,587	24,294	599	2,888	421,301
	\$	349,847	1,328,981	2,247,472	2,182,307	748,301	337,096	28,763	59,010	7,281,777
Total	M	100,495	343,285	472,693	629,333	179,167	93,208	2,960	25,606	1,846,747
	\$	1,939,373	5,065,759	10,143,978	9,561,430	3,795,183	1,222,934	206,972	480,004	32,415,633

Table 344.—Production of Paving Brick* in Canada, 1897-1928

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	M	\$		M	\$		M	\$
1897	4,568	45,670	1906	3,000	45,000	1915	1,228	20,694
1898			1907	3,618	72,354	1916	1,590	30,144
1899	5,300	42,550	1908	3,720	59,456	1917-1921		
1900	2,710	26,950	1909	3,760	67,408	1922	151	5,972
1901	3,689	37,000	1910	4,215	78,980	1923-1925		
1902	4,211	42,000	1911	5,220	79,444	1926	122	5,015
1903	3,789	45,288	1912	4,580	85,989	1927	50	2,103
1904	4,436	55,450	1913	4,208	75,669	1928	338	4,464
1905	4,500	54,000	1914	2,707	49,627			
						Total	71,719	1,031,230

* Figures prior to 1907 compiled by the Ontario Bureau of Mines.

Table 345.—Production of Structural Tile in Canada, by Provinces, 1926-1928

Province	Hollow blocks (including fireproofing and load-bearing tile)		Roofing tile		Floor tile (quarries)	
	Tons	Value	No.	Value	Sq. ft.	Value
1926		\$		\$		\$
Nova Scotia.....	5,141	60,615				
Quebec.....	33,627	281,342				
Ontario.....	76,794	710,595	17,018	1,562	195,011	43,854
Manitoba.....	2,511	29,132				
Saskatchewan.....	4,400	44,000				
Alberta.....	12,591	115,008				
British Columbia.....	6,997	73,958				
Canada.....	142,061	1,314,650	17,018	1,562	195,011	43,854
1927						
Nova Scotia.....	8,792	96,260				
Quebec.....	25,034	257,538				
Ontario.....	86,090	775,806	2,000	140	134,910	32,490
Manitoba.....	1,552	18,862				
Saskatchewan.....	6,500	65,000				
Alberta.....	15,345	142,156				
British Columbia.....	7,393	75,499			375	69
Canada.....	151,203	1,431,441	2,006	140	135,285	32,559
1928						
Nova Scotia.....	11,254	132,594				
Quebec.....	40,607	441,107				50
Ontario.....	112,887	983,005	72,930	6,435	171,020	45,679
Manitoba.....	2,100	25,710				
Saskatchewan.....	10,120	81,202				
Alberta.....	18,432	166,142				
British Columbia.....	9,857	100,392				
Canada.....	205,257	1,930,152	72,930	6,435	171,520	45,729

Table 346.—Production of Sewer Pipe in Canada, 1888-1928

Year	Value	Year	Value	Year	Tons	Value
	\$		\$			\$
1888.....	266,320	1902.....	301,965	1916.....		716,287
1889.....		1903.....	317,970	1917.....		783,762
1890.....	348,000	1904.....	440,894	1918.....	36,574	699,774
1891.....	227,300	1905.....	382,000	1919.....	62,821	1,074,146
1892.....	367,660	1906.....	530,045	1920.....	58,887	1,549,090
1893.....	350,000	1907.....	667,100	1921.....		1,666,584
1894.....	250,325	1908.....	514,362	1922.....	75,932	1,766,347
1895.....	257,045	1909.....	645,722	1923.....	70,252	1,616,324
1896.....	153,875	1910.....	774,110	1924.....	76,355	1,594,280
1897.....	164,250	1911.....	812,716	1925.....	73,791	1,440,269
1898.....	181,717	1912.....	884,641	1926.....	75,996	1,450,776
1899.....	161,546	1913.....	1,035,906	1927.....	77,262	1,475,875
1900.....	231,525	1914.....	1,104,499	1928.....		1,723,644
1901.....	248,115	1915.....	799,446			
				Total.....		39,006,212

*Data not available.

Table 347.—Production of Drain Tile in Canada, 1891-1928

Year	Value	Year	Value	Year	Value	Year	Quantity	Value
	\$		\$		\$		M	\$
*1891.....	90,000	1900.....	225,000	1909.....	408,440	1918.....		499,340
1892.....	100,000	1901.....	250,000	1910.....	370,008	1919.....	20,078	616,510
1893.....	190,000	1902.....	250,000	1911.....	339,812	1920.....	14,527	562,652
*1894.....	280,000	1903.....	275,000	1912.....	357,862	1921.....		473,952
1895.....	210,000	1904.....	260,000	1913.....	338,552	1922.....	14,728	407,386
1896.....	225,000	1905.....	260,000	1914.....	366,340	1923.....	10,599	323,314
1897.....	225,000	1906.....	280,000	1915.....	355,296	1924.....	15,137	409,369
1898.....	225,000	1907.....	260,609	1916.....	359,387	1925.....	14,552	461,503
1899.....	225,000	1908.....	298,561	1917.....	434,708	1926.....	14,258	396,018
						1927.....	22,259	598,098
						1928.....	22,629	656,054
Total.....								12,813,771

*1891-1894 (inclusive), as reported by the Ontario Bureau of Mines.

Table 348.—Production of Drain Tile and Sewer Pipe, in Canada, by Provinces, 1927 and 1928

Province	1927				1928			
	Drain tile		Sewer pipe		Drain tile		Sewer pipe	
	M	\$	Tons	\$	M	\$	Tons	\$
Nova Scotia.....	53	1,610	10,501	202,741	89	3,282		211,833
Quebec.....	323	13,336	5,286	126,035	531	18,833		163,521
Ontario.....	20,330	521,957	50,828	852,187	20,276	572,577		974,157
Manitoba.....	343	16,762	—	—	149	9,211		
Saskatchewan.....	25	800	—	—	15	600		
Alberta.....	157	8,992	7,852	205,581	377	12,761		247,410
British Columbia.....	1,028	34,641	2,795	89,331	1,192	38,790		126,723
Canada.....	22,259	598,098	77,262	1,475,875	22,629	656,054		1,723,644

Table 349.—Production of Pottery from Domestic Clays in Canada, 1888-1928

Year	Value	Year	Value	Year	Value	Year	Value
	\$		\$		\$		\$
1888.....	27,750	1899.....	185,000	1910.....	250,924	1921.....	231,262
1889.....	—	1900.....	200,000	1911.....	102,493	1922.....	266,391
1890.....	195,242	1901.....	200,000	1912.....	43,955	1923.....	229,547
1891.....	258,844	1902.....	200,000	1913.....	53,533	1924.....	238,342
1892.....	265,811	1903.....	200,000	1914.....	35,371	1925.....	267,255
1893.....	213,186	1904.....	140,000	1915.....	64,900	1926.....	320,135
1894.....	162,144	1905.....	120,000	1916.....	61,069	1927.....	307,057
1895.....	151,588	1906.....	150,000	1917.....	122,878	1928.....	356,093
1896.....	163,427	1907.....	253,809	1918.....	130,242		
1897.....	129,629	1908.....	200,541	1919.....	185,474	Total.....	7,393,023
1898.....	214,675	1909.....	285,285	1920.....	209,171		

*Data not available.

Table 350.—Production of Kaolin in Canada, 1912-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1912.....	20	160	1918.....	863	19,299	1924-1926.....		
1913.....	500	5,000	1919.....	759	13,744	1927.....	24	120
1914.....	1,000	10,000	1920.....	683	15,022	1928.....	5	25
1915.....	1,300	13,000	1921.....	124	1,888			
1916.....	1,750	17,500	1922.....	1,197	17,866	Total.....		8,921
1917.....	533	9,594	1923.....	163	2,369			

Table 351.—Production of Fireclay in Canada, 1889-1928

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	Tons	\$		Tons	\$		Tons	\$
1889.....	400	4,800	1903.....	2,639	3,523	1917.....	10,534	49,455
1890.....	250	750	1904.....	5,972	17,466	1918.....	8,732	44,351
1891.....	1,991	4,467	1905.....	5,088	13,917	1919.....	4,600	24,163
1892.....	540	700	1906.....	6,559	18,522	1920.....	8,321	44,091
1893.....	539	2,157	1907.....			1921.....	2,931	29,851
1894.....	1,329	3,492	1908.....	1,984	8,121	1922.....	10,196	55,185
1895.....	842	1,805	1909.....	4,405	12,390	1923.....	2,685	24,158
1896.....	2,118	5,759	1910.....	1,425	5,863	1924.....	3,645	26,258
1897.....	670	1,650	1911.....	7,532	24,128	1925.....	623	6,544
1898.....	599	1,295	1912.....	6,207	24,343	1926.....	2,513	23,258
1899.....	1,245	4,130	1913.....	3,345	14,018	1927.....	5,070	35,961
1900.....	3,979	5,920	1914.....	2,171	12,875	1928.....	5,123	35,284
1901.....	2,741	4,283	1915.....	2,328	12,065			
1902.....			1916.....	9,206	30,767	Total.....	141,177	637,805

Table 352.—Production of Firebrick and Fireclay Blocks and Shapes in Canada, from Domestic Clays, 1907-1928

Year	Firebrick		Fireclay blocks and shapes	Year	Firebrick		Fireclay blocks and shapes
	Quantity	Value	Value		Quantity	Value	Value
	M	\$	\$		M	\$	\$
1907.....	4,323	113,322	18,000	1918.....	7,192	248,884	111,589
1908.....	2,416	70,429	31,752	1919.....	5,610	268,756	96,435
1909.....	1,059	32,742	33,000	1920.....	7,293	375,230	54,792
1910.....	1,375	29,352	15,000	1921.....	4,502	242,462	91,685
1911.....	2,368	44,122	20,880	1922.....	6,705	251,776	67,588
1912.....	3,430	67,192	34,050	1923.....	6,122	295,037	81,345
1913.....	3,667	86,164	42,556	1924.....	4,327	209,256	51,273
1914.....	2,816	72,299	22,394	1925.....	6,197	305,332	36,567
1915.....	2,896	68,700	29,923	1926.....	4,195	192,276	54,064
1916.....	5,689	147,757	56,038	1927.....	5,388	246,296	100,659
1917.....	8,192	199,171	77,885	1928.....	4,940	234,460	105,091
				Total.....	100,702	3,800,985	1,232,571

Table 353.—Production of Refractories, in Canada, from Domestic Clays, by Provinces, 1927 and 1928

Province	1927					1928				
	Fireclay		Firebrick		Fire-clay blocks and shapes	Fireclay		Firebrick		Fire-clay blocks and shapes
	Quantity	Value	Quantity	Value	Value	Quantity	Value	Quantity	Value	Value
	Tons	\$	M	\$	\$	Tons	\$	M	\$	\$
Nova Scotia.....	2,688	8,986	227	14,050	525	2,615	9,705	138	10,799	1,050
New Brunswick.....	53	2,112	40	2,216		67	1,818			1,621
Saskatchewan.....	1,008	7,531	693	37,085	61,634	1,327	9,183	713	40,582	73,301
Alberta.....			107	5,850				84	4,507	
British Columbia.....	1,321	17,332	4,321	187,065	38,500	1,114	14,548	4,005	178,572	29,119
Canada.....	5,070	35,961	5,388	246,266	100,659	5,123	35,284	4,940	234,460	105,091

Table 354.—Plants Reporting Shipments in the Clay Products Industry in Canada, by Provinces, 1928

Province	Number of plants in groups indicated					
	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	Total
Nova Scotia.....	6	1	1		1	9
New Brunswick.....	1			1		2
Quebec.....	17	1	1		1	20
Ontario.....	116	3	1	2		122
Manitoba.....	5					5
Saskatchewan.....	5					5
Alberta.....	9		1	1		11
British Columbia.....	10		1		1	12
Canada.....	169	5	5	4	3	186

Table 355.—Capital Employed in the Clay Products Industry in Canada, by Provinces, 1927 and 1928

Industry and Province	1927				1928			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
BY INDUSTRIES—								
<i>Brick and Tile—</i>								
* Nova Scotia.....	351,977	38,460	109,507	499,944	376,538	60,408	83,298	520,244
Quebec.....	8,749,788	632,280	507,019	9,889,087	9,043,693	802,217	485,021	10,330,931
Ontario.....	9,076,418	1,014,906	1,133,149	11,224,473	9,000,199	1,050,323	1,073,082	11,123,604
Manitoba.....	85,865	90,257	41,337	217,459	166,670	58,610	120,958	346,238
Saskatchewan.....	604,684	67,453	54,831	726,973	873,246	76,443	80,426	1,030,115
Alberta.....	844,000	126,324	104,988	1,075,312	1,210,456	146,865	148,113	1,505,434
British Columbia.....	882,905	181,875	97,225	1,162,005	905,604	187,698	133,873	1,227,175
Total for Canada.....	20,595,637	2,151,560	2,048,056	24,795,253	21,576,406	2,382,564	2,124,771	26,083,741
<i>Clay sewer pipe—</i>								
Total for Canada.....	2,394,988	514,806	336,389	3,246,183	2,745,349	601,476	399,666	3,746,491
<i>Firebrick and fireclay products—</i>								
Total for Canada.....	1,264,247	254,374	491,328	2,009,949	1,355,843	239,986	645,887	2,241,716
<i>Kaolin and other clays—</i>								
Total for Canada.....	12,266	2,668	11,370	26,304				
<i>Stoneware and pottery—</i>								
Total for Canada.....	210,527	82,167	67,224	359,918	261,836	68,008	71,411	401,255
BY PROVINCES—								
<i>Total for clay and clay products—</i>								
Nova Scotia.....	847,120	139,294	86,983	1,073,397	836,452	140,551	77,394	1,054,397
New Brunswick.....	70,700	24,092	34,210	129,002	90,271	16,536	8,734	115,541
Quebec.....	9,282,883	802,820	686,019	10,771,722	9,644,445	961,729	788,032	11,394,206
Ontario.....	11,164,549	1,398,446	1,488,325	14,051,320	11,417,193	1,510,741	1,507,104	14,435,038
Manitoba.....	85,865	90,257	41,337	217,459	166,670	58,610	120,958	346,238
Saskatchewan.....	604,684	67,453	54,831	726,973	873,246	76,443	80,426	1,030,115
Alberta.....	1,526,693	298,665	454,067	2,279,425	2,005,553	339,726	525,214	2,870,493
British Columbia.....	895,171	184,543	108,595	1,188,309	905,604	187,698	133,873	1,227,175
Canada.....	24,477,665	3,005,575	2,954,367	30,437,607	25,939,434	3,292,634	3,241,735	32,473,203

*Includes 1 firm in New Brunswick.

Table 356.—Employees, Salaries and Wages in the Clay Products Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1927				\$	\$	\$
Nova Scotia.....	9	197	206	28,100	141,200	169,300
New Brunswick.....	8	51	59	9,811	32,184	41,995
Quebec.....	78	1,001	1,079	149,938	918,480	1,068,418
Ontario.....	189	2,315	2,504	398,917	2,129,687	2,528,604
Manitoba.....	11	93	104	19,350	91,536	110,886
Saskatchewan.....	13	141	154	26,477	100,820	127,297
Alberta.....	30	322	352	62,211	319,988	382,199
British Columbia.....	22	296	318	49,563	291,045	340,608
Canada.....	360	4,416	4,776	744,367	4,024,940	4,769,307
1928						
Nova Scotia.....	11	212	223	31,035	154,543	185,578
New Brunswick.....	4	48	52	18,548	33,586	52,134
Quebec.....	81	1,140	1,221	153,694	1,003,243	1,156,937
Ontario.....	200	2,261	2,461	437,193	2,204,257	2,641,450
Manitoba.....	12	265	277	26,090	117,688	143,778
Saskatchewan.....	13	140	153	28,834	131,222	160,056
Alberta.....	29	445	474	68,941	443,324	512,265
British Columbia.....	19	315	334	41,874	287,326	329,200
Canada.....	369	4,826	5,195	806,209	4,375,189	5,181,398

*See note page 31.

Table 357.—Wage-Earners in the Clay Products Industry in Canada, by Months and by Industries, 1928

Month	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	Total
January.....	1,768	363	136	147	7	2,421
February.....	1,712	368	134	149	7	2,370
March.....	2,207	372	183	150	.....	2,912
April.....	2,785	388	177	153	.....	3,503
May.....	3,902	408	197	158	.....	4,665
June.....	4,227	390	199	154	10	4,980
July.....	4,370	396	203	152	8	5,129
August.....	4,365	408	201	154	8	5,136
September.....	3,953	393	189	157	8	4,708
October.....	3,608	390	196	159	9	4,362
November.....	3,258	381	202	159	8	4,008
December.....	2,603	377	200	159	9	3,348

IMPORTED-CLAY PRODUCTS

In continuance of the custom followed in previous mineral production reports, a short review of the imported-clay products industry is given herewith.

Products made in Canada from imported clays amounted in value to \$2,458,801 in 1928. This total represented a new record for the industry and was 18 per cent over the production value of \$2,088,238 for 1927 and 21 per cent greater than the value of \$2,039,514 for 1926. Among the products made in Canada from clays imported for the purpose were porcelain insulators valued at \$1,321,556, firebrick and other refractories worth \$313,637 and other commodities such as sanitary earthenware, sewer pipe, pottery and ceramic floor tile.

In 1928, statistics for this industry covered the operations of 14 plants, of which 9 were located in Ontario and 5 in Quebec. These concerns employed a capital of \$3,068,562, furnished employment to 696 people whose earnings for the year totalled \$891,125. By manufacturing processes a total of \$1,750,230 was added to the value of purchased materials which cost \$708,571. The Ontario production was valued at \$1,558,435 and shipments from Quebec were worth \$900,366.

At St. John's, Quebec, two plants produced sanitary ware from imported ball and china clays, while a third firm manufactured refractory products and vitrified sewer pipe. Refractory products were also made by one firm at Montreal, two at Toronto, one at Port Robinson and one at Hamilton. Earthenware was produced at Iberville, Quebec, and Hamilton, Ontario. Porcelain insulators were manufactured in Ontario at Georgetown, Hamilton, Niagara Falls and Peterborough. Artware was produced at Oshawa and a plant at Kingston produced ceramic floor tile.

Table 358.—Capital Employed in the Imported-Clay Products Industry in Canada, 1927 and 1928

	1927	1928
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	1,658,328	1,787,149
Cost of supplies and stocks on hand.....	722,593	642,919
Cash, trading and operating accounts and bills receivable.....	453,899	638,494
Total.....	2,834,820	3,068,562

Table 359.—Employees, Salaries and Wages in the Imported-Clay Products Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
						\$	\$	\$
1927								
Quebec.....	29	3	207	6	245	68,824	253,028	321,852
Ontario.....	42	14	306	45	407	138,945	382,738	521,683
Canada.....	71	17	513	51	652	207,769	635,766	843,535
1928								
Quebec.....	27	4	237	6	274	73,431	292,824	366,255
Ontario.....	38	11	331	42	422	144,464	380,406	524,870
Canada.....	65	15	568	48	696	217,895	673,230	891,125

* See note page 31.

Table 360.—Wage-Earners in the Imported-Clay Products Industry in Canada, by Months, 1927 and 1928

Month	Number		Month	Number	
	1927	1928		1927	1928
January.....	495	526	July.....	525	636
February.....	504	524	August.....	521	635
March.....	503	529	September.....	522	665
April.....	506	550	October.....	517	664
May.....	521	597	November.....	504	651
June.....	535	594	December.....	505	640

LIME

Statistics obtained during the census of 1871 show 1,010 lime kilns in operation in Canada. These kilns were located in Nova Scotia, New Brunswick, Quebec and Ontario. Capital invested in plant and equipment as recorded during that year was \$128,508, and employees numbered 2,042, earning \$157,943; the value of lime produced was \$502,156. A substantial growth was shown in this industry according to data obtained ten years later; active kilns had increased to 1,274 with a corresponding advance in capital investment to a total of \$309,354. Employment in 1881 was furnished 2,537 wage-earners who received \$203,631 and the value of lime produced was \$707,132.

Lime production in Canada during 1928 reached a new high level amounting to 508,889 tons valued at \$4,534,568 or 14.4 per cent greater in quantity and 15.6 per cent greater in value than the 1927 production of 444,753 tons worth \$3,923,388. Canadian producers received an average of \$12.28 per ton for hydrated lime and \$8.28 per ton for quicklime.

Lime producers reported shipments of 46,573 tons of quicklime and 43,620 tons of hydrated lime to the building trades; 153,334 tons of quicklime and 1,187 tons of hydrated lime to chemical works; and 100,788 tons of quicklime and 4,375 tons of hydrated lime to pulp and paper works.

Imports of lime into Canada during 1928 were recorded at 5,417 tons appraised at \$64,811. Exports of Canadian lime amounted to 20,043 tons valued at \$357,085.

Table 361.—Production of Lime in Canada, 1886-1928

Year	Value	Year	Bushels	Value	Year	Bushels	Value
	\$			\$			\$
1886.....	283,755	1900 (Estimated).....		800,000	1914.....	7,028,582	1,360,628
1887.....	394,859	1901 (Estimated).....		830,000	1915.....	5,047,244	1,015,702
1888.....	339,951	1902 (Estimated).....		892,000	1916.....	5,493,250	1,091,463
1889.....	362,848	1903 (Estimated).....		900,000	1917.....	6,567,170	1,558,487
1890.....	412,308	1904 (Estimated).....		780,000	1918.....	6,363,951	1,876,025
1891.....	251,215	1905 (Estimated).....		750,000	1919.....	7,147,504	2,310,607
1892.....	411,270	1906.....	5,230,406	1,009,177	1920.....	9,427,334	3,818,553
1893 (Estimated).....	900,000	1907.....	4,755,316	974,595	1921.....	6,879,066	2,781,197
1894.....	900,000	1908.....	3,691,468	712,947	1922.....	8,972,971	3,165,005
1895.....	700,000	1909.....	5,502,924	1,132,756	1923.....	10,035,319	3,266,608
1896.....	650,000	1910.....	5,848,146	1,137,079	1924.....	9,136,952	3,178,541
1897.....	650,000	1911.....	7,533,525	1,517,599	1925.....	10,256,542	3,387,652
1898 (Estimated).....	650,000	1912.....	8,475,839	1,844,849	1926.....	11,825,736	3,781,484
1899 (Estimated).....	800,000	1913.....	7,558,484	1,609,398	1927.....	12,707,221	3,923,388
					1928.....	14,539,686	4,534,568
Total.....							63,646,514

Table 362.—Production of Lime in Canada, 1927 and 1928, Showing Purposes for Which Sold or Used

Purpose for which sold or used	1927				1928			
	Quicklime		Hydrated lime		Quicklime		Hydrated lime	
	Bushels	Value	Tons	Value	Bushels	Value	Tons	Value
		\$		\$		\$		\$
Building trades.....	1,428,188	490,395	37,817	483,528	1,330,657	478,496	43,620	572,571
Chemical works.....	3,726,114	1,082,085			4,380,972	1,282,493	1,187	14,596
Glass works.....	186,903	53,985			190,400	55,757		
Smelters.....	895,818	110,983			1,086,657	191,540	108	1,230
Pulp and paper mills.....	2,536,096	606,752	6,457	49,698	2,879,657	718,534	4,375	39,966
Sugar refineries.....	213,766	74,876			288,171	80,572		
Tanneries.....	77,728	24,396	229	1,900	98,943	28,949	366	3,342
Agricultural uses (fertilizer).....	16,649	7,899	1,744	14,982	20,171	4,657	2,168	18,057
Dealers (uses unspecified).....	806,741	259,058	15,856	181,795	976,943	292,007	17,808	204,917
Other consumers.....	783,675	371,462	9,141	109,594	1,002,286	419,186	10,337	127,698
Total sold or used.....	10,671,678	3,081,891	71,244	841,497	12,254,857	3,552,191	79,969	982,377

Table 363.—Production of Lime in Canada, by Provinces, 1926-1928

Province		Quicklime		Hydrated Lime		Total	
		Sold or used		Sold or used		Sold or used	
		Bushels	Value	Bushels	Value	Bushels	Value
			\$		\$		\$
Nova Scotia.....	1926	446,626	56,777	7,171	3,000	453,797	59,777
	1927	872,914	100,134	286	120	873,200	100,254
	1928	1,015,257	167,386	17,714	8,490	1,032,971	175,876
New Brunswick.....	1926	477,226	196,477			477,226	196,477
	1927	343,111	148,321			343,111	148,321
	1928	321,029	130,484	714	300	321,743	139,784
Quebec.....	1926	2,509,006	667,480	340,629	98,636	2,849,635	766,116
	1927	2,773,648	725,876	302,171	80,789	3,075,819	806,665
	1928	2,938,828	795,999	322,029	100,783	3,260,857	896,782
Ontario.....	1926	5,402,261	1,593,468	1,120,486	457,978	6,522,747	2,051,446
	1927	5,668,087	1,657,552	1,278,543	540,687	6,946,630	2,198,239
	1928	6,517,171	1,870,476	1,402,429	597,367	7,919,600	2,467,843
Manitoba.....	1926	498,875	147,401	186,514	103,868	685,389	251,269
	1927	421,175	123,831	227,800	122,448	648,975	246,279
	1928	571,600	173,127	238,029	146,572	809,629	319,699
Alberta.....	1926	108,309	39,517			108,309	39,517
	1927	130,596	46,947			130,596	46,947
	1928	190,629	69,588			190,629	69,588
British Columbia.....	1926	503,033	317,733	225,600	99,149	728,633	416,882
	1927	462,147	279,230	226,743	97,453	688,890	376,683
	1928	700,343	345,131	303,914	128,865	1,004,257	473,996
Canada.....	1926	9,945,336	3,018,853	1,880,400	762,631	11,825,736	3,781,484
	1927	10,671,678	3,081,891	2,035,543	841,497	12,707,221	3,923,388
	1928	12,254,857	3,552,191	2,284,829	992,377	14,539,686	4,534,563

Table 364.—Imports into Canada and Exports of Lime, 1926-1928

Item	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Imports.....	3,868	42,855	5,784	70,075	5,417	64,811
Exports.....	18,712	344,616	21,069	367,939	20,013	357,085

Table 365.—Capital Employed in the Lime Industry in Canada, by Provinces, 1927 and 1928

Province	1927				1928			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....					56,495	2,600	3,200	62,295
New Brunswick*.....	153,630	39,011	57,224	249,865	107,500	28,450	11,500	147,450
Quebec.....	1,176,779	179,793	359,822	1,716,394	1,279,684	179,843	306,665	1,766,192
	1,763,605	238,529	225,265	2,227,399	2,177,855	240,340	244,043	2,662,238
Manitoba.....	466,544	30,879	8,326	505,749	487,061	46,046	3,230	536,337
	139,578	22,981	20,703	183,262	146,741	30,123	21,989	198,853
British Columbia.....	1,102,043	86,227	129,542	1,317,812	1,335,840	93,260	149,614	1,578,714
Canada.....	4,802,179	597,420	800,882	6,200,481	5,591,176	620,662	749,241	6,952,079

*Includes data for Nova Scotia in 1927.

Table 366.—Employees, Salaries and Wages in the Lime Industry in Canada, by Provinces, 1927 and 1928

Province	†Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1927				\$	\$	\$
New Brunswick*	10	101	111	16,400	95,309	111,709
Quebec	18	262	280	32,415	227,582	259,997
Ontario	44	410	454	82,005	422,097	504,102
Manitoba	8	113	121	14,166	69,194	83,360
Alberta	4	20	24	4,900	22,336	27,236
British Columbia	13	129	142	18,309	128,995	147,304
Canada	97	1,035	1,132	168,195	965,513	1,133,708
1928						
Nova Scotia	1	51	52	1,800	57,372	59,172
New Brunswick	5	58	67	16,540	47,501	64,041
Quebec	22	297	319	37,810	272,220	319,039
Ontario	41	443	484	81,830	468,422	559,252
Manitoba	7	112	119	12,968	82,684	95,652
Alberta	4	28	32	5,700	31,868	37,568
British Columbia	16	129	145	28,084	171,316	199,400
Canada	100	1,118	1,218	184,732	1,131,383	1,316,115

* Includes data for Nova Scotia.

† See note page 31.

Table 367.—Wage-Earners in the Lime Industry in Canada, by Provinces and by Months, 1928

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January	42	33	243	393	76	20	106	913
February	42	25	238	391	69	19	114	898
March	49	28	197	408	85	20	122	909
April	53	37	248	416	100	19	124	997
May	58	68	298	434	128	22	113	1,121
June	54	64	328	436	127	37	128	1,174
July	50	65	323	443	127	39	133	1,189
August	47	63	347	431	135	35	139	1,197
September	53	60	327	421	118	37	152	1,168
October	51	61	333	453	121	35	173	1,227
November	51	67	318	461	111	25	168	1,201
December	52	46	207	420	98	23	171	1,017

SAND AND GRAVEL

Production statistics for the sand and gravel industry in Canada were first collected in 1912. Prior to that year the only data available consist of Customs' records of sand and gravel exported. In 1886 exportations amounted to 124,865 tons; twenty-four years later exports had risen to 624,824 tons appraised at \$407,974. During 1912, production was valued at \$1,512,099 and wages paid to the 875 pit employees totalled \$527,425. It was not until 1916 that tonnage statements were obtained from the operators in this industry; the total for that year amounted to 8,156,207 tons at \$1,838,320. Since 1918, the annual production has exceeded the 10-million-ton mark. The highest market valuation per ton for this material was received in 1920, when 11,530,795 tons were sold for \$4,201,067. During that year, the 186 producers employed 1,546 men whose total earnings were \$1,343,212. Statistics for 1922, showed that the investment in plant and equipment by the 342 sand and gravel operators amounted to \$4,098,928, while the 750 men employed received \$684,626 and produced 11,666,374 tons valued at \$3,502,935. In 1928 a total capital investment of \$7,783,135 was reported by the 493 operators. Salaries and wages paid to the 7,831 employees totalled \$2,468,468, and the production of 28,102,917 tons valued at \$5,809,431 set up a new high record for the industry. The 1928 production was 22.4 per cent greater in quantity but 4.1 per cent lower in value than the totals of 22,952,819 tons worth \$6,055,601 for 1927.

Imports of sand and gravel into Canada in 1928 amounted to 588,211 tons appraised at \$275,322, consisting of 585,885 tons from the United States, 2,176 tons from Belgium, and minor quantities from the United Kingdom, Newfoundland, Bermuda, France and Japan. Silica sand imported for glass and carborundum manufacture and for use in steel foundries totalled 154,384 tons at \$332,338, including 121,578 tons from the United States, 27,783 tons from Belgium, 5,023 tons from the Netherlands, and a small shipment from the United Kingdom. Sand and gravel exports were recorded at 797,111 tons appraised at \$232,422.

For statistical purposes, the sand and gravel industry has been divided into two parts comprising the operations of (1) railway companies producing sand and gravel for ballast and other purposes; (2) all other producers.

The figures given in the following tables do not include the operations of railway companies except where specifically mentioned. The railway companies were not asked to furnish any statistics for this industry other than figures for production and employment, as, owing to the varied nature of their operations, it would have been difficult for them to give the detailed data generally required.

Table 368.—*Production of Sand and Gravel in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	124,865	24,226	1901.....	197,302	117,465	1916.....	8,156,207	1,838,320
1887.....	180,860	30,307	1902.....	159,793	119,120	1917.....	9,182,417	2,326,249
1888.....	260,929	38,338	1903.....	355,792	124,006	1918.....	11,262,282	2,367,018
1889.....	283,044	52,647	1904.....	399,809	189,803	1919.....	10,364,481	2,680,460
1890.....	342,158	65,518	1905.....	306,935	152,805	1920.....	11,530,795	4,201,067
1891.....	243,724	59,501	1906.....	336,550	139,712	1921.....	11,574,862	2,537,249
1892.....	297,878	85,329	1907.....	298,095	119,853	1922.....	11,666,374	3,502,935
1893.....	329,116	121,795	1908.....	298,954	161,387	1923.....	12,752,515	3,016,518
1894.....	324,656	86,940	1909.....	481,584	256,166	1924.....	11,603,500	3,181,083
1895.....	277,162	118,359	1910.....	624,824	407,974	1925.....	11,018,647	3,220,410
1896.....	224,769	80,110	1911.....	573,494	408,110	1926.....	17,112,798	4,941,434
1897.....	152,963	76,729	1912.....	.....	1,512,099	1927.....	22,952,819	6,055,601
1898.....	165,954	90,498	1913.....	.....	2,258,874	1928.....	28,102,917	5,809,431
1899.....	242,450	101,640	1914.....	.....	2,505,310			
1900.....	197,558	101,666	1915.....	.....	1,624,767	Total.....		56,908,889

* Exports prior to 1912 as no production statistics were collected.

Table 369.—Production in Canada, Imports and Exports of Sand and Gravel, 1926-1928

Kind	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Sand—						
Moulding sand.....	79,373	62,151	86,541	56,017	42,060	46,404
Building sand and sand for concrete, roads, etc.....	2,026,847	808,023	4,416,014	1,162,936	2,380,366	829,659
Filter sand.....	.....	.....	.....	.....	4,500	18,000
Other sand (including blast, core and engine sands).....	88,736	27,303	139,772	47,117	111,326	31,724
Sand and Gravel—						
Sand and gravel for railway ballast.....	6,595,161	774,055	8,294,927	1,167,916	11,981,398	1,198,360
Sand and gravel for concrete, roads, etc.....	7,686,432	3,005,365	9,309,091	3,259,678	12,530,310	2,061,139
Filter gravel.....	.....	.....	.....	.....	4,000	16,000
Crushed gravel.....	636,249	264,537	703,474	361,937	1,048,957	608,145
Total.....	17,112,798	4,941,434	22,952,819	6,055,601	28,102,917	5,809,431
IMPORTS—						
Sand, silica for glass and carborundum manufacture, etc.....	155,109	372,488	148,831	346,138	154,384	332,338
Sand and gravel, n.o.p.....	254,935	212,038	289,741	200,470	588,211	275,322
Total.....	410,044	584,526	438,572	546,608	742,595	607,660
EXPORTS.....	907,935	278,278	637,627	177,999	797,111	232,422

Table 370.—Production of Sand and Gravel in Canada, by Railway Operators, 1926-1928

Kind	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
Sand—		\$		\$		\$
Moulding sand.....	365	540	1,256	1,669		
Building sand and sand for concrete, roads, etc.....	85,885	17,096	13,018	10,112	71,701	12,477
Other sand (including blast, core and engine sands).....	42,385	8,140	83,261	13,127	95,100	15,896
Sand and Gravel—						
Sand and gravel for railway ballast.....	6,273,965	694,485	7,729,663	937,653	11,957,131	1,195,710
Sand and gravel for concrete, roads, etc....	212,306	48,588	130,795	50,660	1,473,022	160,567
Total.....	6,614,906	768,849	7,957,993	1,013,221	13,596,954	1,384,650

Table 371.—Production of Sand and Gravel in Canada, by Operators Other than Railways. 1926-1928

Kind	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
Sand—		\$		\$		\$
Moulding sand.....	79,008	61,611	85,285	54,348	42,060	46,404
Building sand and sand for concrete, roads, etc.....	1,940,962	790,927	4,402,996	1,152,824	2,308,665	817,182
Filter sand.....					4,500	18,000
Other sand (including blast, core and engine sands).....	46,351	19,163	56,511	33,990	16,226	15,828
Sand and Gravel—						
Sand and gravel for railway ballast.....	321,196	79,570	565,264	230,263	24,267	2,650
Sand and gravel for concrete, roads, etc....	7,474,126	2,956,777	9,178,293	3,209,018	11,057,288	2,900,572
Filter gravel.....					4,000	16,000
Crushed gravel.....	636,249	264,537	703,474	361,937	1,048,957	608,145
Total.....	10,497,892	4,172,585	14,994,826	5,042,380	14,505,963	4,424,781

Table 372.—Production of Sand and Gravel in Canada, by Provinces, 1926-1928

Kind	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1926								
Sand—								
Moulding sand.....tons	60			78,120	956			237
\$	150			59,482	1,062			1,457
Building sand.....tons	15,275		628,433	1,260,569	47,188	37,800	5,513	32,069
\$	14,097		197,045	540,213	20,670	25,500	2,042	8,456
Other sand (including blast, core and engine sands).....tons	4,172	750	8,660	45,045	4,033	16,008	1,455	8,613
\$	3,275	364	1,105	16,419	635	3,305	334	1,866
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	208,549	50,334	957,958	1,681,762	622,092	785,766	1,441,657	847,043
\$	34,288	6,902	133,834	149,683	73,065	108,905	178,576	88,802
Sand and gravel for concrete, roads, etc.....tons	2,250	19,847	3,528,459	2,924,523	302,882	24,327	285,851	598,293
\$	1,142	4,094	1,134,204	1,321,950	77,564	7,586	201,421	257,404
Crushed gravel.....tons			110,187	493,143	12,429		20,490	
\$			24,486	204,931	5,063		30,057	
Total.....tons	239,396	70,931	5,233,697	6,483,162	989,580	863,901	1,754,966	1,486,255
 \$	52,952	11,369	1,490,674	2,252,678	178,059	145,296	412,430	357,985
1927								
Sand—								
Moulding sand.....tons	30			85,965	435			111
\$	75			54,806	453			683
Building sand.....tons	67		3,328,414	980,863	56,548	9,365	7,086	33,671
\$	25		696,691	426,118	19,843	7,566	2,833	9,860
Other sand (including blast, core and engine sands).....tons	3,440	1,295	48,228	53,647	4,057	18,850	3,375	6,880
\$	2,591	370	6,746	31,470	1,196	2,450	563	1,731
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	128,855	368,228	1,493,512	1,934,930	995,344	1,426,247	1,149,166	798,645
\$	16,144	114,460	288,172	198,602	130,963	214,619	104,641	100,315
Sand and gravel for concrete, roads, etc.....tons	680,584	18,543	3,744,536	3,823,518	248,648	37,689	215,737	539,836
\$	503,888	3,938	879,098	1,395,948	65,626	20,665	161,083	229,432
Crushed gravel.....tons			1,048	633,840	28,548	25,650	17,388	
\$			10,224	298,785	10,574	17,800	24,554	
Total.....tons	812,976	388,066	8,615,738	7,512,763	1,333,586	1,517,801	1,392,752	1,379,143
 \$	522,723	118,768	1,880,931	2,465,729	228,655	263,100	293,674	342,621
1928								
Sand—								
Moulding sand.....tons	30			41,505	162			363
\$	75			44,241	120			1,968
Building sand and sand for concrete, roads, etc.....tons	305	1,323	1,119,304	1,063,231	56,788	4,085	21,369	113,961
\$	35	132	354,036	410,262	23,397	872	9,286	31,639
Filter sand.....tons			4,500					
\$			18,000					
Other sand (including blast, core and engine sands).....tons	2,657	2,807		15,802	49,776	21,654	8,343	10,287
\$	2,391	1,400		13,448	7,638	3,524	813	2,510
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	85,749	451,766	2,337,895	2,931,604	1,272,009	1,601,486	1,875,077	1,425,812
\$	13,156	44,468	178,594	247,339	154,260	196,054	185,049	179,440
Sand and gravel for concrete, roads, etc.....tons	18,525	24,223	4,662,133	5,664,392	231,760	537,549	636,671	752,057
\$	11,446	6,782	1,123,300	1,115,246	60,665	186,025	261,703	295,972
Filter gravel.....tons			4,000					
\$			16,000					
Crushed gravel.....tons	189,000	11,352	8,509	672,874	43,434	60,750	31,248	31,790
\$	84,000	1,401	11,352	399,771	15,926	45,000	32,555	18,140
Total.....tons	296,266	491,471	8,136,341	10,359,408	1,653,929	2,225,524	2,575,708	2,334,270
 \$	111,163	54,183	1,701,282	2,230,397	262,006	431,475	489,496	529,669

Table 373.—Capital Employed in the Sand and Gravel Industry in Canada, by Provinces, 1927 and 1928

Province	1927				1928			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Quebec.....	1,105,340	32,530	123,436	1,261,306	1,076,843	36,477	120,501	1,233,821
Ontario.....	4,061,806	42,742	441,919	4,546,467	4,180,122	66,997	252,415	4,499,534
Manitoba.....	292,549	7,200	82,108	381,857	314,051	24,262	124,590	462,903
Saskatchewan.....	54,750	2,000	.....	56,750	80,000	3,000	.....	83,000
Alberta.....	324,200	800	2,000	327,000	323,000	4,800	2,000	329,800
British Columbia.....	1,047,632	28,518	19,282	1,095,432	1,139,825	15,305	18,947	1,174,077
Canada.....	6,886,277	113,790	668,745	7,668,812	7,113,841	150,841	518,453	7,783,135

Table 374.—Employees, Salaries and Wages in the Sand and Gravel Industry by Provinces, 1927 and 1928

Province	†Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1927						
Nova Scotia*.....	.....	210	210	.....	27,548	27,548
Quebec.....	35	4,817	4,852	55,773	695,000	750,813
Ontario.....	57	849	906	118,975	671,923	790,898
Manitoba.....	9	228	237	15,970	89,769	105,739
Saskatchewan.....	4	351	355	4,000	107,476	111,476
Alberta.....	2	222	224	3,780	83,155	86,935
British Columbia.....	12	337	349	27,925	142,628	170,553
Canada.....	119	7,014	7,133	226,423	1,817,539	2,043,962
1928						
Nova Scotia.....	.....	195	195	.....	47,787	47,787
New Brunswick.....	.....	74	74	.....	13,449	13,449
Quebec.....	10	4,635	4,645	17,902	657,122	675,024
Ontario.....	60	1,295	1,355	127,089	863,525	990,614
Manitoba.....	8	275	283	14,560	101,413	115,973
Saskatchewan.....	4	473	477	7,000	148,898	155,898
Alberta.....	1	386	387	1,700	177,412	179,112
British Columbia.....	12	403	415	31,494	259,117	290,611
Canada.....	95	7,736	7,831	199,745	2,268,723	2,468,468

*Includes data for New Brunswick.

† See note page 31.

Table 375.—Wage-Earners in the Sand and Gravel Industry in Canada, by Months and by Provinces, 1928

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
January.....	2	1	52	196	9	2	2	81	545
February.....	2	1	61	211	4	2	2	103	356
March.....	2	1	114	379	13	4	6	172	691
April.....	3	1	126	600	30	20	81	186	1,047
May.....	116	30	445	883	120	149	131	285	2,169
June.....	164	39	4,510	1,092	179	212	172	325	6,693
July.....	153	19	4,500	1,111	184	120	188	338	6,613
August.....	139	9	498	1,051	130	133	172	281	2,413
September.....	33	15	486	1,039	43	148	211	254	2,229
October.....	47	1	419	947	46	110	209	224	2,093
November.....	11	1	412	685	32	126	131	121	1,519
December.....	5	1	164	429	4	27	56	99	785

SAND-LIME BRICK

Because of its association with other building materials, data regarding the production of sand-lime brick are included in this report. Statistics relating to sand-lime brick are not included in the totals for structural materials industries as both the sand and lime used have been so recorded; production of sand-lime brick is regarded as a manufacturing operation and therefore is shown in the report on the *Manufactures of the Non-Metallic Minerals*, issued annually by the Bureau.

Production from the sand-lime brick industry in Canada rose to a new high value during 1928 at \$1,112,466. In 1927 the output value for this industry was \$939,911 and in 1926 the total stood at \$629,672. Production in 1928 included 82,271 thousand sand-lime brick worth \$1,038,510 as against a production of 72,864 thousand valued at \$864,911 in 1927 and 50,282 thousand at \$606,409 in 1926. The remainder of the output in each year consisted mainly of hollow building blocks.

Eleven plants were in operation during 1928, seven of which were located in Ontario, two in Quebec, and two in Manitoba.

Capital employed in this industry was \$1,916,060 as compared with \$1,586,064 in 1927. Employees numbered 270, whose combined earnings totalled \$352,311. Purchased materials were valued at \$322,027 and consisted principally of quicklime and sand. Quicklime consumption amounted to 467,011 bushels and sand used reached a total of 127,337 cubic yards.

Table 376.—Sand-Lime Brick Manufactured in Canada, by Provinces, 1926-1928

Province	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
	M	\$	M	\$	M	\$
Quebec.....			8,182	96,926	14,122	203,249
Ontario.....	46,869	555,847	61,297	721,485	61,506	745,719
Manitoba.....	3,413	50,562	3,385	46,500	6,643	89,542
Total.....	50,282	606,409	72,864	864,911	82,271	1,038,510

SLATE

Slate deposits located along the south shore of the St. Lawrence river in Quebec, were operated for the first time in 1854. Production from these deposits reached a maximum in point of value in 1889 when 6,935 tons valued at \$119,160 were shipped. These shipments consisted of roofing slates, mantles and slabs. Quarrying operations were carried on at the Quebec deposits up to 1923, in which year 1,836 tons of crushed green and red slate were shipped for use in the manufacture of roofing paper. No production has been recorded since that date.

During 1908, a slate quarry was operated at Jarvis Inlet, British Columbia.

Table 377.—Production of Slate in Canada, 1886-1928

Year	Tons*	Value	Year	Tons*	Value	Year	Tons*	Value
		\$			\$			\$
1886.....	5,345	64,675	1899.....		33,406	1912.....	1,894	8,939
1887.....	7,357	89,000	1900.....		12,100	1913.....	1,432	6,444
1888.....	5,314	90,689	1901.....	715	9,980	1914.....	1,075	4,837
1889.....	6,935	119,160	1902.....		19,200	1915.....	397	2,039
1890.....	6,368	100,250	1903*	5,510	22,040	1916.....	1,262	6,223
1891.....	5,000	65,000	1904.....	5,277	23,247	1917.....	1,422	7,789
1892.....	5,180	68,070	1905.....		21,568	1918.....	933	5,124
1893.....	7,112	90,825	1906.....		24,446	1919*	1,632	10,853
1894.....		75,556	1907.....	4,335	20,056	1920.....	(a)	14,200
1895.....		58,906	1908.....	2,950	13,496	1921.....	(b)	22,325
1896.....		53,370	1909.....	4,000	19,000	1922.....	1,899	14,871
1897.....		42,800	1910.....	3,959	18,492	1923.....	1,836	17,289
1898.....		40,791	1911.....	1,833	8,248	1924-1928.....		
						Total.....		1,326,292

*1903 to 1919 inclusive quantity recorded in squares.

(a) 1,532 squares valued at \$12,362 and 240 tons crushed slate at \$1,838.

(b) 415 squares valued at \$4,063 and 2,232 tons crushed slate at \$18,262.

Table 378.—Imports of Slate into Canada, 1926-1928

	1926		1927		1928	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
Roofing.....Squares	4,963	57,418	6,427	73,006	7,453	95,468
School-writing.....		92,766		72,101		83,248
Pencils.....		6,361		7,025		8,036
Mantles and manufactures of slate, n.o.p.		61,597		53,934		52,544
Total.....		218,142		206,066		239,296

THE STONE INDUSTRY IN CANADA

Including (1) The Stone Quarrying Industry and (2) The Monumental and Ornamental Stone Industry

(1) PRIMARY PRODUCTION—The Stone Quarrying Industry

Statistics of the stone industry as set forth in the general tables of this report have been confined to quarrying operations and to the production of dressed stone when this operation is carried on in conjunction with the quarrying. The kinds of stone quarried in Canada include granite (trap-rock, syenite and other igneous rock), limestone, marble and sandstone. In 1928, granite was produced in Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, and British Columbia; limestone was obtained in all provinces except Prince Edward Island and Saskatchewan; marble was quarried in Nova Scotia, Quebec, and British Columbia; and the sandstone output had its source in Nova Scotia, New Brunswick, Quebec, Ontario, Alberta and British Columbia.

Stone production from Canadian quarries during 1928 advanced 12·97 per cent in quantity and 10·87 per cent in value; the total shipments were 8,253,934 tons valued at \$10,272,301 as compared with 7,306,436 tons worth \$9,265,304 shipped in 1927. Ontario was the leading producer, accounting for 55·5 per cent of the total output; Quebec followed with 36·3 per cent and the other provinces in order of tonnages produced were: British Columbia, Manitoba, Nova Scotia, New Brunswick and Alberta.

Granite production in Canada has increased from 6,062 tons in 1886 to a grand total of 1,195,810 tons in 1928.

The value of limestone production has advanced from a total of \$2,139,691 in 1909 to \$7,267,437 in 1928. During the latter year 81·9 per cent of the production was marketed as crushed stone for concrete aggregates, road metal and similar uses; 4·4 per cent as building, monumental and ornamental stone; 3·7 per cent for flux; 3·7 per cent for use in sugar factories and chemical works; the remainder, or 6·3 per cent consisted of rubble and riprap and small tonnages of flag-stones, agricultural limestone and poultry grit. Considerable tonnages of limestone are also quarried for use in the production of cement and lime.

The production of marble in Canada during the period 1886-1896 was relatively small, totalling 3,391 tons valued at \$45,837. From 1897 to 1907, inclusive, records do not show any production of marble in Canada. With the opening of quarries at Philipsburg and South Stukely, Quebec; at Bancroft and Marble Bluff, Ontario; and near Lardeau and on Nootka Sound, British Columbia, the production became of considerable importance. In 1908 marble shipments were valued at \$125,000 but in 1912 an advance to a total valuation of \$260,764 was made. The maximum output value for the industry of \$521,572 was reached in 1926 when 3,442 tons of marble for building purposes and 1,853 tons of crushed marble were shipped from Quebec and Ontario deposits. The 1928 production totalled 7,753 tons valued at \$414,682.

Sandstone produced in Canada during 1909 was valued at \$374,179; the following year there was an increase in production to a total of \$502,148 the highest output value recorded for this industry. The period 1921-1923, inclusive, showed a considerable falling-off in production, but in 1924, an advance to 94,603 tons valued at \$240,273 was made. Shipments of sandstone during 1928 totalled 100,951 tons worth \$223,236.

Table 379.—Production of Granite in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	3,062	63,309	1901.....	.....	155,000	1916.....	.....	1,247,267
1887.....	21,217	142,506	1902.....	.....	210,000	1917.....	.....	639,412
1888.....	21,352	147,305	1903.....	.....	200,000	1918.....	.....	590,871
1889.....	10,197	79,624	1904.....	.....	150,000	1919.....	.....	850,563
1890.....	13,307	65,985	1905.....	.....	226,305	1920.....	.....	1,508,916
1891.....	13,637	70,056	1906.....	.....	278,419	1921.....	319,398	937,894
1892.....	24,302	89,326	1907.....	151,136	194,712	1922.....	457,925	1,486,250
1893.....	22,521	94,393	1908.....	.....	282,320	1923.....	398,432	1,159,303
1894.....	16,392	109,936	1909.....	.....	454,824	1924.....	419,971	1,013,345
1895.....	19,238	84,838	1910.....	.....	739,516	1925.....	971,718	2,014,535
1896.....	18,717	106,709	1911.....	.....	1,119,865	1926.....	1,064,423	1,574,627
1897.....	10,345	61,934	1912.....	.....	1,373,119	1927.....	730,099	1,383,557
1898.....	23,897	81,073	1913.....	.....	1,653,791	1928.....	1,195,810	2,366,946
1899.....	13,418	90,542	1914.....	.....	2,176,602			
1900.....	.....	80,000	1915.....	.....	1,525,553	Total.....		28,881,048

Table 380.—Production of Limestone and Sandstone in Canada, 1886-1928

Year	Lime- stone	Sand- stone	Year	Lime- stone	Sand- stone	Year	Limestone		Sandstone	
							Tons	Value	Tons	Value
	\$			\$	\$			\$		\$
1886.....	650,384		1900.....	1,564,582		1914.....	2,672,781		487,140	
1887.....	581,367		1901.....	1,837,737		1915.....	2,312,081		249,336	
1888.....	664,825		1902.....	2,127,055		1916.....	2,224,091		146,244	
1889.....	937,000		1903.....	2,230,939		1917.....	2,283,659		261,256	
1890.....	984,787		1904.....	2,114,315		1918.....	2,342,403		102,750	
1891.....	723,004		1905.....	2,072,758		1919.....	3,074,815		86,577	
1892.....	633,188		1906.....	2,084,056		1920.....	5,665,693		165,149	
1893.....	1,131,006		1907.....	1,832,550		1921.....	3,322,024	5,155,046	28,426	78,036
1894.....	1,269,645		1908.....	1,681,293		1922.....	3,152,124	4,175,941	25,221	80,908
1895.....	1,136,603		1909.....	2,139,691	374,179	1923.....	3,687,663	4,475,921	22,766	66,547
1896.....	1,042,850		1910.....	2,249,576	502,148	1924.....	4,249,061	4,831,684	94,603	240,273
1897.....	1,037,448		1911.....	2,594,926	451,183	1925.....	4,643,853	5,049,563	87,502	145,757
1898.....	1,335,403		1912.....	2,762,936	329,352	1926.....	5,283,745	5,657,328	44,127	112,347
1899.....	1,551,886		1913.....	3,204,091	396,782	1927.....	6,438,379	7,145,917	132,799	232,793
						1928.....	6,949,420	7,267,437	100,951	223,236
						Total.....	77,285,580		4,731,992	

Table 381.—Production of Marble in Canada, 1886-1928

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	501	9,900	1897-1907.....			1918.....		550
1887.....	242	6,224	1908.....		125,000	1919.....		213,982
1888.....	191	3,100	1909.....		158,441	1920.....		240,593
1889.....	83	980	1910.....		158,779	1921.....	1,650	172,720
1890.....	780	10,776	1911.....		162,783	1922.....	1,912	231,894
1891.....	240	1,752	1912.....		260,764	1923.....	2,473	201,518
1892.....	340	3,600	1913.....		249,875	1924.....	4,379	322,455
1893.....	590	5,100	1914.....		132,533	1925.....	3,046	254,922
1894.....			1915.....		158,027	1926.....	5,295	521,572
1895.....	200	2,000	1916.....		118,310	1927.....	5,209	503,037
1896.....	224	2,405	1917.....		55,820	1928.....	7,753	414,682
						Total.....		4,704,694

Table 382.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1927

Item		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—									
Rough.....	tons	308	3,012	115,622	21,638	27,444		569	168,593
\$		2,920	7,994	212,359	143,149	109,974		6,353	482,749
Dressed.....	tons	24	207	43,060	10,026	3,050		330	56,697
\$		1,925	4,544	736,912	114,364	121,162		14,000	992,907
Monumental and ornamental—									
Rough.....	tons	2	627	8,256	63			1,968	10,916
\$		45	8,779	142,928	846			30,387	182,985
Dressed.....	tons	585	583	3,297	92			886	5,443
\$		34,800	40,450	478,120	3,602			41,778	598,750
Flagstone.....	tons			240	1,292				1,532
\$				150	11,723				11,873
Curbstone.....	tons		25	16,332	6			8	16,371
\$			382	68,687	150			200	69,419
Paving blocks.....	tons		330	20,531	880			20	21,761
\$			2,796	122,986	8,919			500	135,201
Limestone, for flux.....	tons	66,594		3,081	230,141			45,928	345,744
\$		69,092		2,773	187,068			38,060	296,993
Limestone for sugar factories, chemical works, etc.....	tons		14,100	101,096	15,900	6,718	2,335	32,958	173,107
\$			23,535	76,510	11,330	9,518	3,808	64,824	189,525
Poultry grit.....	tons		23		9			149	181
\$			197		45			1,021	1,263
Ground limestone for agricultural use.....	tons	1,700	10,029	8,290	3,772			528	24,319
\$		6,200	31,199	28,835	2,681			2,727	71,642
Rubble and riprap.....	tons	3,238		105,179	189,124	12,081		40,997	359,619
\$		5,825		78,078	115,678	11,291		35,049	245,921
Crushed.....	tons		972	2,109,547	3,782,017	105,373	1,032	132,212	6,131,153
\$			1,215	2,319,977	3,461,154	66,611	4,022	133,097	5,986,076
Total.....	tons	72,451	29,908	2,531,531	4,254,969	154,666	3,367	256,553	7,306,436
\$		120,807	121,091	4,268,315	4,060,709	318,556	7,830	367,996	9,265,304
Per cent of total.....	Quantity	0.99	0.41	34.69	58.23	2.12	0.05	3.51	100.00
Value		1.30	1.31	46.07	43.83	3.44	0.08	3.97	100.00

Table 383.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1928

Item	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—								
Rough..... tons	1,183	55	99,488	110,106	11,227		2,027	224,086
..... \$	14,194	633	233,947	107,754	52,805		14,541	423,874
Dressed..... tons	12	1,478	37,134	58,669	9,033	158	350	106,834
..... \$	1,349	19,201	1,262,258	85,287	335,121	9,500	15,000	1,727,716
Monumental and ornamental—								
Rough..... tons	256	817	10,675	115			870	12,733
..... \$	3,328	16,548	126,327	1,869			31,280	179,352
Dressed..... tons	580	458	708	60			1,055	2,861
..... \$	36,618	30,833	16,737	2,193			51,300	137,681
Flagstone..... tons			300	1,636				1,936
..... \$			218	14,924				15,142
Curbstone..... tons		133	21,404					21,537
..... \$		2,250	118,847					121,097
Paving blocks..... tons		119	22,531	5,433			10	28,093
..... \$		1,270	138,842	44,649			200	184,961
Limestone, for flux..... tons	70,500		1,331	155,433			29,649	256,913
..... \$	72,765		1,723	117,863			24,181	216,532
Limestone for sugar factories, chemical works, etc..... tons		15,017	159,724	45,547		2,177	37,259	259,724
..... \$		23,525	133,657	55,088		3,720	51,985	267,975
Poultry grit..... tons			100	10		5	172	287
..... \$			655	50		30	1,159	1,894
Ground limestone for agricultural use..... tons	1,850	9,415	11,133	2,285			279	24,962
..... \$	6,555	28,245	42,375	2,285			1,813	81,273
Rubble and riprap..... tons	8,115	12,500	359,602	98,718	95,400		45,876	620,211
..... \$	14,991	14,596	351,495	91,807	96,513		43,940	613,342
Crushed..... tons	38,672	6,340	2,268,062	4,103,917	120,204	2,670	153,892	6,633,757
..... \$	63,975	5,880	2,422,119	3,517,799	123,778	11,490	156,421	6,301,462
Total..... tons	121,168	46,332	2,992,192	4,581,929	235,864	5,010	271,439	8,253,934
..... \$	213,775	142,981	4,849,200	4,011,568	608,217	24,740	391,820	10,272,301
Per cent of total..... Quantity	1.47	0.57	36.25	55.51	2.85	0.06	3.29	100.00
..... Value	2.08	1.39	47.21	39.34	5.92	0.24	3.82	100.00

Table 384.—Production of Stone in Canada, by Kinds and by Provinces, 1927 and 1928

Province	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1927		\$		\$		\$		\$
Nova Scotia.....	611	36,770	68,294	75,292			3,546	8,745
New Brunswick.....	1,634	53,695	25,124	56,146			3,150	11,250
Quebec.....	162,180	757,582	2,251,499	2,863,690	4,609	484,437	116,243	162,606
Ontario.....	390,679	294,098	3,854,421	3,716,419			9,860	50,192
Manitoba.....			154,666	318,558				
Alberta.....			3,367	7,830				
British Columbia.....	174,945	241,412	81,008	107,984	600	18,600		
Canada.....	730,049	1,353,557	6,438,379	7,145,917	5,209	503,037	132,799	232,793
1928								
Nova Scotia.....	39,360	102,295	72,350	79,320	160	2,975	9,298	29,185
New Brunswick.....	5,485	66,435	30,772	57,650			10,075	18,896
Quebec.....	230,560	1,241,668	2,684,305	3,116,753	6,843	380,307	70,584	110,472
Ontario.....	605,275	566,601	3,967,098	3,421,064			9,556	53,903
Manitoba.....	114,000	114,000	121,864	494,217				
Alberta.....			4,852	15,240			158	9,500
British Columbia.....	201,030	275,947	68,179	83,193	950	31,400	1,280	1,280
Canada.....	1,195,810	2,366,946	6,949,420	7,267,437	7,753	414,682	100,951	223,236

Table 385.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1928

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	3,576	25,877	82,933	300,147			82,084	156,725
Dressed.....	15,241	267,194	41,146	716,929			310	8,784
Monumental and ornamental—								
Rough.....	9,744	136,763	130	1,036	1,042	45,186		
Dressed.....	2,821	147,510	104	1,523	2,518	449,717		
Flagstone.....			312	484			1,220	11,389
Curbstone.....	16,365	69,269	6	150				
Paving blocks.....	21,761	135,201						
Limestone, for flux.....			345,744	296,993				
Limestone for sugar factories, chemical works, etc.....			173,107	189,525				
Poultry grit.....	5	200	176	1,063				
Ground limestone for agricultural use.....			24,319	71,642				
Rubble and riprap.....	48,054	41,524	294,931	191,859			7,634	12,538
Crushed stone.....	612,482	560,019	5,475,471	5,374,566	1,649	8,134	41,551	43,357
Total.....	730,049	1,383,557	6,438,379	7,145,917	5,209	503,037	132,799	232,793

Table 386.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1928

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	9,409	107,042	207,310	248,312	480	19,642	6,887	48,878
Dressed.....	11,865	667,050	91,886	702,081	1,870	340,585	1,213	18,000
Monumental and ornamental—								
Rough.....	8,933	127,652	3,000	30,000	800	21,700		
Dressed.....	2,486	125,744	225	2,237	150	9,700		
Flagstone.....			305	418			1,631	14,724
Curbstone.....	21,537	121,097						
Paving blocks.....	28,093	184,961						
Limestone, for flux.....			256,913	216,532				
Stone for sugar factories, chemical works, etc.....			257,825	265,212	1,899	2,763		
Poultry grit.....	3	60	184	1,179	100	655		
Ground limestone for agricultural use.....			24,962	81,273				
Rubble and riprap.....	173,123	163,294	414,470	406,863			32,618	43,185
Crushed stone.....	940,361	870,046	5,692,340	5,313,330	2,454	19,637	58,602	98,449
Total.....	1,195,810	2,366,946	6,949,420	7,267,437	7,753	414,682	100,951	223,236

Table 387.—Production in Canada, by Kinds and by Provinces, and Imports and Exports of Stone, 1926-1928

	1926		1927		1928	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION, BY KINDS—						
Granite.....	1,064,423	1,574,627	730,049	1,383,557	1,195,810	2,366,946
Limestone.....	5,283,745	5,657,328	6,438,379	7,145,917	6,949,420	7,267,437
Marble.....	5,295	521,572	5,209	503,037	7,753	414,682
Sandstone.....	44,127	112,347	132,799	232,793	100,951	223,236
Total.....	6,397,590	7,865,874	7,306,436	9,265,304	8,253,934	10,272,301
PRODUCTION, BY PROVINCES—						
Nova Scotia.....	92,315	150,792	72,451	120,807	121,168	213,775
New Brunswick.....	19,108	99,545	29,908	121,091	46,332	142,981
Quebec.....	2,305,734	3,728,228	2,534,531	4,268,315	2,992,192	4,849,200
Ontario.....	3,622,042	3,157,288	4,060,709	4,581,929	4,041,568	4,041,568
Manitoba.....	101,571	357,884	154,666	318,556	235,864	608,217
Alberta.....	3,759	13,890	3,367	7,830	5,010	24,740
British Columbia.....	253,061	358,247	256,553	367,996	271,439	391,820
Canada.....	6,397,590	7,865,874	7,306,436	9,265,304	8,253,934	10,272,301
IMPORTS—						
Building stone, other than marble or granite, sawn on more than two sides, but not sawn on more than four sides.....	262	4,223	500	6,793	306	4,085
Building stone other than marble or granite, planed, turned, cut or further manufactured than sawn on four sides.....	591	28,561	190	14,333	259	27,781
Flagstone, granite, rough sandstone, and all building stone, not hammered, sawn or chiselled.....		187,055		183,777		214,977
Flagstone and building stone, other than marble or granite, sawn on not more than two sides.....		95,790		101,006		213,448
Granite, sawn only.....		6,189		5,250		7,637
Granite, manufactures of, n.o.p.....		175,651		188,364		63,932
Granite monuments*.....						129,466
Paving blocks.....						10,919
Marble, rough, not hammered or chiselled.....		91,039		92,077		137,120
Marble, sawn or sand rubbed, not polished.....		186,462		151,288		170,074
Marble, manufactures of, n.o.p.....		101,748		103,603		126,729
Refuse stone.....	334,832	220,177	352,467	213,609	597,134	373,453
Manufactures of stone, n.o.p.....		47,719		50,000		70,826
Total.....		1,144,614		1,110,100		1,550,447
EXPORTS—						
Crushed stone.....	101,117	134,755	46,772	66,820	128,379	209,852
Granite and marble, unwrought.....	3,553	38,828	3,314	33,289	2,529	26,034
Freestone, limestone, and other building stone, unwrought.....	2,853	3,915	712	7,437	383	3,664
Dressed stone.....		17,090		33,760		10,665
Total.....		194,588		141,306		250,215

*From April 1, 1928.

Table 388.—Capital Employed in the Stone Quarrying Industry in Canada, by Provinces, 1927 and 1928

Province	1927				1928			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	1,115,816	26,422	784	1,143,022	1,103,499	19,257	5,192	1,127,948
New Brunswick.....	120,792	32,879	17,350	171,021	138,811	22,727	36,341	197,879
Quebec.....	3,295,983	593,599	811,303	4,700,885	3,923,816	606,103	975,481	5,505,400
Ontario.....	5,774,455	287,235	560,842	6,622,532	6,866,465	403,907	654,433	7,924,803
Manitoba.....	292,396	33,709	163,818	489,923	373,531	78,315	88,577	540,423
Alberta.....					4,000			4,000
British Columbia.....	591,363	54,480	37,758	683,601	628,879	48,667	49,546	727,092
Canada.....	11,190,805	1,028,324	1,591,855	13,810,984	13,639,001	1,178,976	1,809,570	16,027,547

Table 389.—Employees, Salaries and Wages in the Stone Industry in Canada, by Provinces, 1927 and 1928

Province	*Average number of employees			Salaries and Wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1927						
Nova Scotia.....	5	78	83	5,504	57,773	63,277
New Brunswick.....	10	94	104	12,810	56,611	69,421
Quebec.....	120	2,960	3,089	200,509	2,564,970	2,765,479
Ontario.....	82	1,396	1,478	160,571	1,143,385	1,303,956
Manitoba.....	7	148	155	16,554	168,556	185,110
British Columbia.....	10	152	162	23,915	160,447	184,362
Canada.....	234	4,837	5,071	419,863	4,151,742	4,571,605
1928						
Nova Scotia.....	6	86	92	9,195	79,217	88,412
New Brunswick.....	11	89	100	24,568	77,479	102,047
Quebec.....	126	2,690	2,816	241,480	2,215,272	2,456,752
Ontario.....	89	1,581	1,670	190,223	1,356,414	1,546,637
Manitoba.....	14	257	271	35,863	359,853	395,716
Alberta.....		9	9		7,500	7,500
British Columbia.....	12	159	171	26,805	183,145	209,950
Canada.....	258	4,871	5,129	527,634	4,278,880	4,806,514

*See note page 31.

Table 390.—Wage-Earners in the Stone Industry in Canada, by Months and by Provinces, 1928

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January.....	19	24	1,008	486	216		89	1,842
February.....	28	27	1,045	520	218		108	1,946
March.....	38	69	1,251	636	213		122	2,329
April.....	74	94	1,604	1,034	190		123	3,119
May.....	99	96	2,170	1,561	255	5	134	4,300
June.....	92	85	2,689	1,768	262	7	145	5,048
July.....	99	98	2,798	1,790	295	8	166	5,254
August.....	79	95	2,847	1,693	300	9	169	5,212
September.....	110	93	2,603	1,473	275	12	156	4,722
October.....	109	88	2,603	1,295	280	11	146	4,532
November.....	106	77	2,387	1,168	273	10	154	4,175
December.....	92	58	1,840	864	187	8	135	3,184

(2) The Monumental and Ornamental Stone Industry

This industry includes the cutting, polishing or other finishing of stone in plants not operated in conjunction with quarries.

Production from the 222 stone dressing works in the Dominion rose to a new high level of \$7,176,034 in 1928 as compared with a total of \$5,606,984 in 1927. These totals include cut and polished stone for ornamental, monumental and building purposes; the largest single item for 1928 was limestone for building which was valued at \$2,861,336. Distribution by provinces of the plants in operation during 1928 was as follows: Ontario, 118; Quebec, 45; Manitoba, 13; British Columbia, 11; New Brunswick, 10; Nova Scotia, 10; Saskatchewan, 8; Alberta, 5; and Prince Edward Island, 2. Stone used in these plants during 1928 cost \$2,460,900; capital employed amounted to \$6,305,519; employees numbered 1,686, and salaries and wages totalled \$2,578,707.

Table 391.—Number of Plants, Employees and Value of Products of the Monumental and Ornamental Stone Industry in Canada, by Provinces, 1927 and 1928

Province	1927			1928		
	Number of plants	Number of employees	Selling value of products	Number of plants	Number of employees	Selling value of products
			\$			\$
Prince Edward Island and Nova Scotia.....	13	48	159,147	12	45	162,066
New Brunswick.....	11	60	150,134	10	73	146,846
Quebec.....	40	269	838,892	45	324	1,081,091
Ontario.....	119	774	3,217,742	118	963	4,739,095
Manitoba.....	14	210	659,452	13	132	396,303
Saskatchewan.....	8	48	232,848	8	53	302,054
Alberta.....	5	56	191,160	5	53	201,865
British Columbia.....	9	45	157,609	11	43	146,711
Canada.....	228	1,514	5,606,984	222	1,686	7,176,034

Table 392.—Products of the Monumental and Ornamental Stone Industry in Canada, 1927 and 1928

Item	1927	1928
	Total selling value at works	Total selling value at works
	\$	\$
Granite, cut and polished—(a) Monuments.....	1,728,293	1,718,988
(b) For building purposes.....	83,877	314,553
Marble, cut and polished—(a) Monuments.....	420,651	404,058
(b) For building purposes.....	673,126	883,075
Marble chips and dust.....	6,591	24,677
Limestone—(a) Monuments and bases.....	97,264	132,406
(b) For building purposes.....	1,713,445	2,861,336
Finished monuments, lettered only.....	844,132	773,975
Other products.....	39,605	62,966
Total.....	5,606,984	7,176,034

CHAPTER XI

DIRECTORY

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given and the location of the properties worked in 1928 is also shown.

METAL MINING INDUSTRIES

Alluvial Gold Mining Industry

Name	Address	Location
BRITISH COLUMBIA—		
Adams, Geo. (Delta Gold Mining Co.)	Atlin	McKee Creek.
Big Bend Platinum and Gold Mining Co., Ltd.	744 W. Hastings St., Vancouver	Similkameen.
Bride, Maurice	Atlin	Lynn Creek.
Brown, Frank and Marshall, J.	Atlin	Wright Creek.
Campbell, Robert	Grand Forks	Grand Forks mining Division.
Cassiar Hydraulic Mines Ltd.	Wrangell, Alaska	Dease Creek.
Compagnie Française des Mines d'Or du Canada	Atlin	Atlin Creek.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail	Slate, Manson and Antler Creeks.
Crawford, Frank	Porter Landing	Porter Landing.
Cronholm, F. N.	425 North Crescent Heights Blvd., Los Angeles, Calif., U.S.A.	Clearwater River.
Dease Creek Mines Corporation	401 Mutual Life Bldg, Seattle, Wash., U.S.A.	Dease Creek.
Discovery Mining and Power Co.	Atlin	Pine Creek.
Falconer, D. K.	Discovery	Spruce Creek.
Giddings, E.	Barkerville	Barkerville.
Hawks, A. McL.	340 Stockton St. San Francisco, U.S.A.	Tulameen River.
Hopp, John	Barkerville	Cariboo.
Howard, Bartley	Coalmont	Similkameen.
Jones, J. F.	Coalmont	Granite Creek.
Kafue Copper Development Co., Ltd.	612 Pacific Bldg., Vancouver	Antler Creek.
Kemp, Henry	206-318 Homer St., Vancouver	Cariboo.
Lake Creek Placer Mine	Lumberton	Lumberton.
Lake Surprise Mining Co.	1002-3rd Ave., Seattle, Wash., U.S.A.	Atlin.
Mathias Gold Mining Co. of British Columbia, Ltd.	219 Alaska Bldg., Bellingham, Wash. U.S.A.	Quesnel River.
Matthews, Isaac	Atlin	Spruce Creek.
McKinnon, C. E.	Discovery	Key Creek.
Mosquito Hydraulic Association	727-23rd Ave., Seattle, Wash., U.S.A.	Mosquito Creek.
Ness, Geo. A.	Lumberton	Lumberton.
Finlay River Co., Ltd.	602 Hastings St. W., Vancouver	Finlay Forks.
Point Hydraulic Mine	Barkerville	Slough Creek.
Pendleton Gold Mining Corporation	3835 Wallingford Ave., Seattle, Wash., U.S.A.	McDome Creek.
Prpict, Tom	Atlin	O'Donnell River.
Rees, R. D.	Barkerville	Shepherd Creek.
Revenue Mining Co. Ltd.	804 Standard Bank Bldg., Vancouver	Cedar Creek.
Sang, Dang	Barkerville	Slough Creek.
Sundberg, Magnus	Cottonwood	Donovan Creek.
Tong Sing Tong	Barkerville	Slough Creek.
Tournquist, Emil	Atlin	Ruby Creek.
Wendle, Jos.	Barkerville	French Creek.
Williams, C. M.	Revelstoke	Boulder Creek.
Williams, J. F.	Stanley, Cariboo	Last Chance Creek.
Wing and Benjamin Co.	Wrangell, Alaska	Quartz Creek.
Wong Mon Hong	Barkerville	Last Chance Creek.
YUKON—		
Burrall and Baird	Dawson	Dawson Mining Division.
New North West Corporation, Ltd.	Dawson	Dawson Mining Division.
Weinberg, A. E.	Miller Creek	Miller Creek.

Auriferous Quartz Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
Acadia Gold Mines Ltd.	Enfield	Acadia	Oldham.
*Bower Mining Co. Ltd.	Yarmouth	Bower	Yarmouth Co.
*Crease, J. A.	Mount Uniacke	West Lake	Mount Uniacke.
*Malag' Mining Co. Ltd.	Malaga Gold Mines	Malaga	Queens Co.
Novomac Mines and Power Corporation (formerly Consolidated Mines and Power Corp.)	Halifax, Box 216	Goldenville	Goldenville.
*Pleasant River Gold Mines Ltd.	Box 348, Kentville	Pleasant River	Lunenburg Co.
*Tangier Mining and Power Co., Ltd.	Tangier	Tangier	Tangier.

Auriferous Quartz Mining Industry—Continued

Name	Address	Name of Mine	Location
QUEBEC			
*Graham Bousquet Mining Corporation.	603 Royal Bank Building, Toronto, Ont.	Graham Bousquet.....	Bousquet Tp.
*Malartic Gold Mines Ltd.....	530 Excelsior Life Bldg., Tor- onto, Ont.	Malartic.....	Fournier Tp.
O'Brien and Fowler Ltd.....	816 Ottawa Electric Bldg., Ottawa, Ont.		Cadillac Tp.
*Siscoe Gold Mines Ltd.....	276 St. James St., Montreal...	Siscoe.....	Dubuisson Tp.
*Thompson Cadillac Mining Co., Ltd...	200 Bay St., Toronto, Ont.		Cadillac Tp.
ONTARIO			
<i>Afton Townships—</i>			
*Afton Mines, Ltd.....	Box 1933, Sudbury.....	Golden Rose.....	Afton Tp.
<i>Boston Creek Area—</i>			
Barry-Hollinger Gold Mines, Ltd...	807 General Assurance Bldg., Toronto.	Barry-Hollinger.....	Pacaud Tp.
*Poston McCreia Gold Mines Ltd.....	510 Kent Bldg., Toronto.	Boston McCreia.....	Pacaud Tp.
*Hilltop Gold Mines, Ltd.....	1700 Sterling Tower, Toronto	Hilltop.....	Catharine Tp.
*Ostrom Gold Mines Ltd.....	15 St. Clair Ave., West Toron- to.	Ostrom.....	Catharine Tp.
*Ridgeway Gold Mines Ltd.....	613 Dominion Bank Bldg., Northbrook.....	Gold Ridge.....	Catharine Tp.
<i>Frontenac Area—</i>			
*Ore Chimney Mining Co.....	Kenora.....	Ore Chimney.....	Barrie Tp.
<i>Kenora Area—</i>			
*Kenora Prospectors and Miners, Ltd.		Mikado.....	Shoal Lake.
<i>Kirkland Lake Area—</i>			
*Abba Mines Ltd.....	Room 217, 73 Adelaide St. W., Toronto.	Abba.....	Teck Tp.
*Bidgood Consolidated Mines, Ltd...	171 Yonge St., Toronto.....	Bidgood.....	Lebel Tp.
*Cambro Kirkland Mines, Ltd.....	171 Yonge St., Toronto.....	Cambro.....	Lebel Tp.
*Conroyal Mines Ltd.....	911 Kent Bldg., Toronto.....	Conroyal.....	Lebel Tp.
*Continental Kirkland Mines, Ltd...	Box 752 Kirkland Lake.	Continental Kirkland...	Lebel Tp.
*Federal Kirkland Mining Co., Ltd...	208 Northern Ontario Bldg., Toronto.	Federal Kirkland.....	Teck and Lebel Tps.
*Four Nations Reserve Mining Co...	Kenogami Lake.....	Four Nations.....	Grenfell Tp.
*Harker Gold Mines Ltd.....	1402 Concourse Bldg., Toronto	Harker Gold.....	Harker Tp.
*Kirkland—Hudson Bay Gold Mines Ltd.	New Liskeard.....	Kirkland-Hudson Bay...	Teck Tp.
*Kirkland-Hunton Mines Ltd.....	Room 32, 171 Yonge St., Tor- onto.	Hunton.....	Teck Tp.
Kirkland Lake Gold Mining Co., Ltd.	810 Lumsden Bldg., Toronto	Kirkland Lake.....	Teck Tp.
Lake Shore Mines Ltd.....	Kirkland Lake.....	Lake Shore.....	Teck Tp.
*Lebel Oro Mines Ltd.....	319 Bay St., Toronto.....	Lebel Oro.....	Lebel Tp.
*Macassa Mines Ltd.....	Kirkland Lake.....	Macassa.....	Teck Tp.
*Moffatt Hall Mines Ltd.....	Kirkland Lake.....	Moffatt-Hall.....	Lebel Tp.
*Pawnee Kirkland Gold Mines Ltd...	Room 607, 11 King St. W., Toronto.	Pawnee Kirkland.....	Lebel Tp.
Sylvanite Gold Mines Ltd.....	Kirkland Lake.....	Sylvanite.....	Teck Tp.
Teck-Hughes Gold Mines Ltd.....	Kirkland Lake.....	Teck-Hughes.....	Teck Tp.
Tough Oakes, Burnside Gold Mines.	Kirkland Lake.....	Tough Oakes.....	Teck and Lebel Tps.
*Trout Creek Gold Mining Co., Ltd..	Bank of Commerce Bldg., St. Catharines.	Trout Creek Gold Mine.	Teck Tp.
Wright-Hargreaves Mines Ltd.....	Bridgeburg.....	Wright-Hargreaves....	Teck Tp.
<i>Larder Lake Area—</i>			
Argonaut Consolidated Mines Ltd....	145 St. James St., Montreal, P.Q.	Argonaut.....	Gauthier Tp.
Canadian Associated Goldfields, Ltd.	15 Wellington St. W., Toronto.	Costello.....	Larder Lake.
<i>Larder Lake Area—</i>			
*Crown Reserve Consolidated Mines, Ltd.	171 Yonge St., Toronto.....	Crown Reserve.....	McVittee Tp.
*Murphy Mines Ltd.....	208 Northern Ontario Bldg., Toronto.	Murphy.....	Gauthier Tp.
*Northland Gold Mines Ltd.....	Northland Mines.....	Northland Gold.....	Gauthier Tp.
*Ritchie Gold Mines Ltd.....	11 King St. W., Toronto.....	Ritchie Gold.....	Gauthier Tp.
*Walsh-Katrine Gold Mines, Ltd...	1006-1410 Stanley St., Mont- real, P.Q.	Walsh-Katrine.....	Katrine Tp.
<i>Lightning River Area—</i>			
Blue Quartz Gold Mines, Ltd.....	1104 Northern Ontario Bldg., Toronto.	Blue Quartz.....	Painkiller Lake.
<i>Mickipicoten Area—</i>			
*Cooper Gold Mines, Ltd.....	302 Bay St. Toronto.....	Cooper.....	Algoma Dist.
*Towagmac Exploration Co., Ltd....	921 New Birks Bldg., Mont- real, P.Q.	Michael-Boyle Option...	Goudreau.
<i>Mongowin Tp.—</i>			
*McMillan Gold Mines, Ltd.....	52 Elm St., Sudbury.....	House Lake.....	Mongowin.
<i>Northwestern Ontario Area—</i>			
*Bonanza United Mines, Ltd.....	806 Royal Bank Bldg., Toronto	Bonanza, Rognon, Redeemer.	Van Horne.
*British Canadian Mines Ltd.....	8 Bloor St. E., Toronto.....	Foley.....	Rainy River Tp.

*Operating but not producing.

Auriferous Quartz Mining Industry—Concluded

Name	Address	Name of Mine	Location
ONTARIO—Concluded			
<i>Patricia Area—</i>			
*Bathurst Mines, Ltd.	51 Sparks St., Ottawa.	Bathurst.	Skinner Tp.
*Bobjo Mines, Ltd.	372 Bay St., Toronto.	Bobjo.	Jackson Manion, P.O.
*Favorable Lake Mining and Exploration Co., Ltd.	1005 Atlas Bldg., Toronto.	Favorable Lake.	Favorable Lake.
*Howey Gold Mines, Ltd.	704 Central Bldg., 45 Richmond St. W., Toronto.	Howey.	Red Lake.
*Jackson Manion Mines, Ltd.	Port Arthur.	Jackson Manion.	Woman Lake.
<i>Porcupine Area—</i>			
Ankerite Gold Mines, Ltd.	Box 535, South Porcupine.	Ankerite.	Deloro Tp.
Coniaurum Mines, Ltd.	50 Ontario St., St. Catharines.	Coniaurum.	Tisdale Tp.
Dome Mines, Ltd.	36 Toronto St., Toronto.	Dome.	Tisdale Tp.
*Hayden Gold Mines Co., Ltd.	509 Brisbane Bldg., Buffalo, Timmins.	Hayden Gold.	Ogden and Delora Tps.
Hollinger Consolidated Gold Mines, Ltd.		Hollinger.	Tisdale Tp.
March Gold Ltd.	Box 533, South Porcupine.	March Gold.	Deloro Tp.
McIntyre Porcupine Mines, Ltd.	Schumacher.	McIntyre, Porcupine.	Schumacher.
*Polaris Gold Mines of Canada, Ltd.	Box 1691 Timmins.	Polaris.	Mount Joy, Tp.
*Rypan Porcupine Mines, Ltd.	7 McCall St., Toronto.	Rypan.	Deloro Tp.
United Mineral Lands, Ltd.	Box 508, South Porcupine.	Pastmaster.	Deloro Tp.
Vipond Consolidated Mines, Ltd.	302 Bay St., Toronto.	Vipond.	Tisdale Tp.
*West Dome Lake Gold Mines, Ltd.	New Liskeard.	West Dome.	Tisdale Tp.
<i>Sudbury Area—</i>			
*Mundell, Wm. A.	Metagama.	Ina.	Sudbury Dist.
<i>Temiskaming District—</i>			
Gold Hill Mines, Ltd.	Haileybury.	Gold Hill.	Catharine Tp.
<i>Thunder Bay Area—</i>			
*St. Anthony Gold Mines Ltd.	255 Bay St., Toronto.	St. Anthony.	Sturgeon Lake.
*Tashota Gold Mines Ltd.	Tashota.	Tashota.	Kowkash Division.
<i>West Shining Tree Area—</i>			
*Atlas Gold Mines, Ltd.	1704 Royal Bank Bldg., Toronto.	Atlas, Gold.	McMurphy Tp.
*The Buckingham Mines, Ltd.	116 Federal Bldg., Toronto.	Buckingham.	Asquith and McMurphy Tps.
Whitney Tp.—			
Scottish-Ontario Syndicate.	Porcupine.	Scottish-Ontario.	Whitney Tp.
MANITOBA			
Central Manitoba Mines, Ltd.	301 Mining Exchange Bldg., Winnipeg.	Central Manitoba.	Long Lake Dist.
*Eldorado Gold Mines, Ltd.	319 Bay St., Toronto, Ont.	Eldorado.	Long Lake, Dist.
BRITISH COLUMBIA			
*B.C. Silver Mines, Ltd.	612 Pacific Bldg., Vancouver.	B.C. Silver.	Portland Canal.
Big Horn Mines, Ltd.	410 Seymour St., Vancouver.	Horn Silver.	Osoyoos Mining Div.
Bosshart, Louis.	Greenwood.	Gold Drop.	Greenwood.
*Columario Gold Mines, Ltd.	357 Bay St., Toronto, Ont.	Valhalla-Kleanza.	Omineca Mining District
*D. W. Mines, Ltd.	Cedarvale.	D. W.	Omineca Mining District.
Euphrates Mining Co., Ltd.	Nelson.	Euphrates and Ell-Tee Groups.	Nelson.
Golden Age Mining Co., Ltd.	Box 788, Nelson.	Golden Age.	Nelson.
Hedley Gold Mining Co., Ltd.	Heldey.	Nickel Plate.	Osoyoos Mining Division.
*Lowary and Norris.	Usk.	Emma.	Omineca Mining Division.
*Marmot River Gold Mines, Ltd.	313 Crown Bldg., Vancouver.	Marmot River Gold.	Portland Canal District.
Midnight Mining Co.	Rossland.	Midnight.	Rossland.
Pioneer Gold Mines of B.C., Ltd.	Pioneer Mine.	Pioneer.	Lillooet Dist.
*Pre Cambrian Gold Mines.	1827 L. C. Smith Bldg., Seattle, Wash., U.S.A.	Pre Cambrian Gold.	Yale Mining Division.
Premier Gold Mining Co., Ltd.	London Bldg., Vancouver.	Premier.	Cassiar Dist.
*Reno Gold Mines, Ltd.	Nelson.	Reno.	Nelson.
*Paul H. Schulz (Hecla Mining Co.)	Grand Forks.	Union Mine.	Kettle Valley Dist.
Second Relief Mining Co., Ltd.	Erie.	Second Relief.	Nelson Division.
Stayner-Allen-Moore-LaVigne and Lohey.	545 Peyton Bldg., Spokane, Wash., U.S.A.	Queen Mine Group.	Nelson Division.

Copper-Gold-Silver Mining Industry

QUEBEC			
*Abaco Syndicate.	Sherbrooke.		Desmeloizes Tp.
*Abana Mines, Ltd.	55 St. James St. W., Montreal.	Abana.	Desmeloizes Tp.
*Abbey Mines, Ltd.	915 Transportation Bldg., Montreal.	Abbey.	Dupuy Tp.
*Abondé Mines, Ltd.	134 King St. E., Toronto, Ont.		Dupuy Tp.
*Alamac Mines, Ltd.	132 St. James St., Montreal.		Desmeloizes Tp.

*Operating but not producing.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
<i>QUEBEC—Continued</i>			
*Albain Exploration, Ltd.	Room 31, 4 Hospital St., Montreal.	Albain.	Duparquet Tp.
*Albion Copper and Gold Mines, Ltd.	445 St. François Xavier St., Room 47, Montreal.		Duparquet and Clericy Tps.
*Aldermac Mines, Ltd.	802 Royal Bank Bldg., Toronto, 2, Ont.	Aldermac.	Boischatel Tp.
*Altura Mines, Ltd.	210 St. James St., Montreal.	Altura.	Dupuy Tp.
*Amulet Mines, Ltd.	Room 716, 132 St. James St., Montreal.	Amulet.	Rouyn Tp.
*Area Mines, Ltd.	132 St. James St., Montreal.	Area.	Rouyn Tp.
*Arntfield Gold Mines, Ltd.	Old Birks Bldg., Montreal.		Boischatel Tp.
*Astoria Rouyn Mines, Ltd.	70 St. Paul St., Quebec.		Rouyn Tp.
*Atlas Exploration Co., Ltd.	414 Ottawa Electric Bldg., Ottawa, Ont.		Ascot Tp.
*Bagamac Rouyn Mines, Ltd.	Haileybury, Ont.		Rouyn Tp.
*Bellehumeur Mining Co., Ltd.	38 King St. West, Toronto, Ont.		Laverlochers Tp.
*Bonnott-Pacaud Mines, Ltd.	1454 Yonge St., Toronto, Ont.		Mattagami Lake.
*Boischatel Mines, Ltd.	610 Blackburn Bldg., Ottawa, Ont.		Boischatel Tp.
*Bona Vista Mining Corporation.	445 St. Francis-Xavier St., Montreal.		Destor Tp.
*Brown-Bousquet Mines, Ltd.	Keefe Bldg., Montreal.		Bousquet Tp.
*Brownlee Gold Mines, Ltd.	Rouyn.		Rouyn.
*Buffalo Rouyn Mines, Ltd.	603 Royal Bank Bldg., Toronto 2, Ont.		Rouyn.
*Cadillac Mining and Development Syndicate, Ltd.	Box 842 Rouyn.		Cadillac and Duprat Tps.
*Canada Quebec Mining Corporation, Ltd.	915 Transportation Bldg., Montreal.		Desmeloizes and Fournière Tps.
*Canadian American Copper Refining Co., Ltd.	207 Notre Dame St. W., Montreal.		Eastman.
*Canadian Rouyn Syndicate.	768 Bloomington Ave., Montreal.		Rouyn.
*Capital Rouyn Gold Mines, Ltd.	Ottawa Electric Bldg., Ottawa, Ont.		Rouyn-Duprat and Boischatel Tps.
*Caribou Copper Corporation, Ltd.	202 Blackburn Bldg., Ottawa, Ont.		Bourlamaque Tp.
*Centre Boischatel Copper Co.	59 Yonge St. Toronto, Ont.		Boischatel Tp.
*La Chatelaine Gold Mines, Ltd.	107, Holbrook Chambers, Ottawa, Ont.		Boischatel and Rouyn Tps.
*Clericy Consolidated Mines, Ltd.	74 Sparks St., Ottawa, Ont.		Clericy Tp.
*Cobalt Contact Mines, Ltd.	8 Bloor St. E., Toronto 2, Ont.		Montbray Tp.
*Colin's Mining Corporation, Ltd.	750 Rue St. Gabriel, Montreal.	Colin.	Destor Tp.
*Consolidated Copper and Sulphur Co., Ltd.	Eustis.		Ascot Tp.
*Consolidated Mining and Smelting Co. of Canada, Ltd.	706 Drummond Bldg., Montreal.		Duprat Tp.
*Copper Creek Exploration Syndicate.	Cheminis.		Dufay Tp.
*Copperfield Mining Syndicate, Ltd.	229 Jackson Bldg., Ottawa, Ont.		Joannes Tp.
*Corona Mines, Ltd.	126 St. Peter St., Quebec.		Duprat Tp.
*Cummings—Trudel Mining and Development Co., Ltd.	107 Sparks St., Ottawa, Ont.		Desmeloizes and Cadillac Tps.
*Cyclone Rapids Mines, Ltd.	1072 Beaver Hall Hill, Montreal.		Clericy Tp.
*Dalquier Mining Co., Ltd.	Amos.		Dalquier Tp.
*Delmas Mines, Ltd.	371 Bay St., Toronto, Ont.		Montbray Tp.
*Destor Mines, Ltd.	25 Rue St-Jacques, Montreal.		Destor Tp.
*Don Rouyn Gold Mines, Ltd.	Canadian Pacific Express Bldg., Montreal.		Rouyn Tp.
*Dubec Mining Co., Ltd.	321 Birks Bldg., Montreal.		Dufresnoy Tp.
*Dufresnoy Lake Exploration Syndicate.	Rouyn.		Destor Tp.
*Dumont Mines, Ltd.	302 Bay St., Toronto, Ont.	Dumont.	Duprat Tp.
*Dunlop Consolidated Mines, Ltd.	1511-67 Yonge St., Toronto, Ont.		Montbray Tp.
*Duparquet Mining Co., Ltd.	204 Hospital St., Montreal.		Duparquet Tp.
*Duparquet Rouyn Mines, Ltd.	443 St-François Xavier St., Montreal.	Duparquet Rouyn.	Duparquet Tp.
*Duprat Mines, Ltd.	126 St. Peter St., Quebec.		Duprat Tp.
*Eplett Metcalf Mining Co., Ltd.	North Temiskaming.	Eplett-Metcalf.	Montbray Tp.
*Fisher-Quebec Gold Mines, Ltd.	506 Central Bldg., Toronto, Ont.		Landrienne Tp.
*Garwar Quebec Mining Co., Ltd.	315 Confederation Life Bldg., Toronto, Ont.		Desmeloizes Tp.
*Gilbec Mines, Ltd.	200 Bay St., Toronto, Ont.		Dufresnoy Tp.
*Granada Rouyn Mining Co., Ltd.	Rouyn.		Rouyn Tp.
*Greene Stabell Mines, Ltd.	Amos.		Dubuisson Tp.
*Harvie Mining Co., Ltd.	912 New Birks Bldg., Montreal.	Harvie.	Clericy Tp.
*Heron, Chas. M.	Box 287, Cobalt, Ont.		Fournière Tp.

*Operating but not producing.

Copper-Gold-Silver Mining Industry—Concluded

Name	Address	Name of Mine	Location
<i>QUEBEC—Continued</i>			
Horne Copper Corporation.....	804 Royal Bank Bldg., Toronto, Ont.		Rouyn Tp.
*Hughes Development Corporation Ltd.	36 Toronto St., Toronto, Ont.		Dasserett Tp.
*Hurricana Quebec Mining Syndicate, Ltd.	1006 Castle Bldg., Stanley St., Montreal.		Malartic Tp.
*Jay Copper-Gold Mines, Ltd.	275 St. James St., Montreal		Dalquier Tp.
*Kawanda Syndicate, Ltd.	514 Ottawa Electric Bldg., Ont.		Dasserat Tp.
*Kinojevis Mining Co., Ltd.	Temiskaming		Rouyn.
*Knox Wiltsey Syndicate.	New Liskeard, Ont.	Knox Wiltsey	Rouyn Tp.
*Lake Dufault Mines, Ltd.	4350 Rue St. Denis, Montreal.		Dufresnoy Tp.
*Lake Maron Gold Mines, Ltd.	Box 506, London, Ont.	Lake Maron.	Dasserat Tp.
*Lake St. John Mining Co., Ltd.	147 Cote de la Montagne, Quebec.		Metabelchoun Tp.
*La Mine d'Or Venus, Ltd.	104 Rue St. Jean, Quebec, Rouyn.		Barraute Tp.
*La pierre Dasserat Mining Syndicate.			Dasserat Tp.
*Laval-Quebec Mines, Ltd.	215 St. James St. W., Montreal.		La Reine and Rouyn Tps.
*Locarno Copper Mines, Ltd.	11 O'Connor St., Ottawa.		Clericy Tp.
*Lorette Mines, Ltd.	25 Rue St-Jacques, Montreal		Dubuisson Tp.
*Mabell Mines, Ltd.	404-620 Cathcart St., Montreal	Mabell	Rouyn.
*Marclay Mines, Ltd.	307 Central Bldg., Toronto, Ont.	Marclay	Boischatel Tp.
*Marillac Mining Syndicate, Ltd.	410 Blackburn Bldg., Ottawa, Ont.	Marillac.	Joannes Tp.
*McDougall Mines, Ltd.	508 Excelsior Life Bldg., Toronto, Ont.	McDougall	Rouyn.
*Mineral Explorations, Ltd.	1201 Bank of Hamilton Bldg., Toronto, Ont.		Montbray Tp.
*Mining Corporation Quebec, Ltd.	350 Bay St., Toronto, Ont.		Noranda.
*Natagan Gold Mines Syndicate, Ltd.	180 Rue Lockwell, Quebec.	Natagan.	Barraute Tp.
*National Base Metals Corporation, Ltd.	75 Sparks St., Ottawa, Ont.	Arno.	Desmeloizes Tp.
*Newbec Mines, Ltd.	603 Royal Bank Bldg., Toronto 2, Ont.	Newbec.	Dufresnoy Tp.
*Norman Mines, Ltd.	410 Blackburn Bldg., Ottawa, Ont.		Malartic Tp.
*North Country Mines, Ltd.	413 Coristine Bldg., Montreal.		Dalquier Tp.
*Notre Dame Mines, Ltd.	35 Notre Dame W., Montreal.		Montbray and Rouyn Tps.
*Nova Mines, Ltd.	35 Notre Dame W., Montreal.	Nova.	Duparquet Tp.
*Obalski Chibougamau Mining Co.	25 Rue St. Jacques E., Montreal.		Chibougamau Dist.
*Obaska Mines, Ltd.	Room 26, 171 Yonge St., Toronto, Ont.	Obaska.	Louiscourt Tp.
*Oriole Mines, Ltd.	501 Continental Life Bldg., Toronto, Ont.	Oriole.	Montbray Tp.
*Osisko Rouyn Exploration Co.	1072 Beaver Hall Hill, Montreal.		Rouyn.
*Pandora Gold, Ltd.	New Liskeard.	Pandora.	Cadillac Tp.
*Parker Island Gold Mines, Ltd.	905-132 St. James St., Montreal.		Dubuisson Tp.
*Pre-Cambrian Holdings, Ltd.	Keefe Bldg., Montreal.		Cadillac and Malartic Tps.
*Quebec Centre Mines, Ltd.	502 Lumsden Bldg., Toronto, Ont.		Boischatel Tp.
*Quebec Malartic Syndicate, Ltd.	610 Blackburn Bldg., Ottawa, Ont.		Malartic Tp.
*Ranger Cadillac Mines Ltd.	Amos.		Cadillac Tp.
*Regionale Mining Co., Ltd.	Ste Croix.		Ste. Croix.
*Renault, A.	Ville Marie.		Dasserat Tp.
*Rex Copper Mines, Ltd.	511 Place d'Armes, Montreal		Desmeloizes and Duparquet Tps.
*Rhyolite Rouyn Mines, Ltd.	1004 Bank of Hamilton Bldg., Toronto, Ont.		Rouyn.
*Riada Mines, Ltd.	21 Richmond St. W., Toronto, Ont.	Riada Rouyn.	Dufresnoy Tp.
*Ribago Copper Corporation Ltd.	Haileybury, Ont.		Boischatel Tp.
*Robb-Montbray Mines, Ltd.	Excelsior Life Bldg., Toronto, Ont.		Montbray Tp.
*Rubec Mines, Ltd.	190 St. James St. Montreal.		Rouyn Tp.
*Ste Annes Syndicate.	78 Manufacturers St., Montreal		Obalski and McKenzie Tps.
*St. Anthony Gold Mines, Ltd.	255 Bay St., Toronto, Ont.		Montbray Tp.
*Sekyer, C. P.	Beauceville West.		Dorchester Co.
*Senator Mines, Ltd.	187 Main St., Hull.		Boischatel Tp.
*Sladen-Malartic Mines, Ltd.	48 Sparks St., Ottawa, Ont.		Malartic and Dubuisson Tp.
*Stadacona Rouyn Mines, Ltd.	Room 611-132 St. James St. Montreal.		Rouyn.

*Operating but not producing.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
QUEBEC—Concluded			
*Star Gold Mines, Ltd.	142 Notre Dame St., Three Rivers.		Clericy Tp.
*Sullivan Gold Mines, Ltd.	Amos.	Sullivan.	Dubuisson Tp.
*Thompson Malartic Mines, Ltd.	408 Brock Bldg., Toronto, Ont.		Cadillac and Malartic Tps.
*Thormoor Copper Mines, Ltd.	311 Federal Bldg., Toronto, Ont.	Thormoor.	Boischatel Tp.
*Tonowanda Exploration Syndicate.	New Liskeard, Ont.	Tonowanda.	Duparquet.
*Toronto Rouyn Syndicate.	Box 103 Rouyn.		Rouyn Tp.
*Towagmac Exploration Co., Ltd.	921 New Birks Bldg., Montreal.		Boischatel Tp.
*Tremont Mining Syndicate.	21 King St. E., Toronto, Ont.		Montbray Tp.
*United Copper Syndicate Ltd.	Insurance Exchange Bldg., Montreal.		Rouyn Tp.
*United Mines of Quebec Ltd.	Room 708 Insurance Exchange Bldg., Montreal.		Dufresnoy Tp.
*United Verde Extension Mining Co.	Noranda.		Rouyn Tp.
*Ville Marie-Rouyn Mining Co.	Ville Marie.		Rouyn Tp.
Waite-Ackerman-Montgomery Mines, Ltd.	802 Royal Bank Bldg., Toronto, Ont.		Duprat Tp.
*Wasamac Mines, Ltd.	4350 St. Denis St., Montreal.	Wasamac.	Boischatel and Dufresnoy Tps.
*Wendt-Wreidt Consolidated Mines, Ltd.	901 Drummond Bldg., Montreal.		Launay Tp.
*Wiltsey-Coghlan Mines, Ltd.	200 Bay St., Toronto, Ont.		Rouyn Tp.
*Windfall-Rouyn Mines, Ltd.	276 St. James St., Montreal.	Windfall-Rouyn.	Clericy Tp.
*Windsor Mines, Ltd.	23 St. Peter St., Quebec.	Windsor.	La Sarre Tp.
*Wood Cadillac Mines, Ltd.	Keefer Bldg., Montreal.		Cadillac Tp.
ONTARIO			
Amity Copper and Gold Mines, Ltd.	501 Lumsden Bldg., Toronto.	Amity.	Boston Creek.
*White Lake Mines, Ltd.	301 Royal Bank Bldg., Toronto.	White Lake.	Algoma Dist.
*Sudbury Basin Mines, Ltd.	36 Toronto St., Toronto.		Vermillion Lake.
*Mineral Explorations, Ltd.	1201 Bank of Hamilton Bldg., Toronto.		Porcupine Mining Division.
*Seymour Copper Mines Ltd.	Rouyn, Que.	Seymour.	Sudbury Dist.
MANITOBA			
*Mandy Mines, Ltd.	The Pas.	Mandy.	Mandy.
*Sherritt Gordon Mines, Ltd.	614 Excelsior Life Bldg., Toronto, Ont.	Sherritt-Gordon.	Cold Lake.
*Manitoba Basin Mines, Ltd.	200 Bay St., Toronto, Ont.		Herb Lake.
*San Antonio Mines, Ltd.	Cooper Bldg., Winnipeg.	San Antonio.	Rice Lake Dist.
*Kingsfisher Gold Mines, Ltd.	598 Stradbroke Ave., Winnipeg.		Long Lake.
*Scarab Mines, Ltd.	171 Market St., Winnipeg.	Scarab.	Rice Lake.
*Flintoba Mines, Ltd.	38 King St. W., Toronto, Ont.	Flintoba.	Thompson Lake.
BRITISH COLUMBIA			
Aurimont Mines, Ltd.	602 Credit Foncier Bldg., Vancouver.		Rocher Deboule Mountain.
*Aurum Mines, Ltd.	Standard Bk. Bldg., Vancouver.		Yale Dist.
Britannia Mining and Smelting Co., Ltd.	Britannia Beach.	Britannia.	Vancouver Co.
*Caledonia Mines, Ltd.	403 Pacific Bldg., Vancouver.	Caledonia Group.	Quats Lake.
*Coast Copper Co., Ltd.	Trail.	Old Sport.	Quatsino.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Tadanac.		Rossland.
*Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.	George Copper.	Portland Canal Mining Division.
*Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.	Spokane, Mohawk, Tennessee.	Clinton Mining Division.
*Consolidated Mining and Smelting Co. of Canada, Ltd.	Drummond Bldg., Montreal, Que.	M and K group.	Omineca Mining Division.
Detroit Western Mining Co.	804 Standard Bank Bldg., Vancouver.	Western Copper.	Khutze Inlet.
Euphrates Mining Co., Ltd.	Box 1020, Nelson.	Euphrates and Ell-Tee Groups.	Nelson Mining Division.
Fenwick and Torshaw.	Box 479 Greenwood.		Greenwood Mining Division.
*Golden Age Mining Co., Ltd.	Box 788 Nelson.	Golden Age.	Nelson Mining Division.
Gold Hill Mining Syndicate.	Box 465 Kamloops.	Gold Hill.	Kamloops Mining Division.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Anyox.	Hidden Creek.	Nass River Mining Division.
Granby Consolidated Mining, Smelting and Power Co., Ltd. (Allenby Plant).	Allenby.	Copper Mountain.	Similkameen Mining Division.

*Operating but not producing.

Copper-Gold-Silver Mining Industry—Concluded

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—Concluded			
*Hills Bar, Ltd.....	220 Alexander St., Vancouver.	Hills Bar.....	Yale Mining Division.
Continental Copper Co.....	Box 520, Kamloops.....	Iron Mask.....	Kamloops Mining Division.
Kootenay Belle Syndicate.....	Box 689 Kelowna.....	Kootenay Belle.....	Kootenay Mining Division.
*Lorne Gold Mines, Ltd.....	Nelson.....	Lorne and Coronation...	Lillooet Mining Division.
Malaspina Mines, Ltd.....	Room 10 McGregor Block, Victoria.	Malaspina.....	Nanaimo Mining District.
North Kootenay Mines, Ltd.....	710 Seymour St., Vancouver..	Pretty Girl.....	Windemere Mining Division.
Romana Copper Mines, Ltd.....	23 Bank of Commerce Bldg., Vancouver.	Romana.....	Nanaimo Mining Division.
*Stenbraten, John.....	Haines, Alaska.....	Stampede.....	Atlin Mining Division.
*Timmins and Woodworth.....	3857 Point Grey Road, Vancouver.	Surf Point.....	Skeena Mining Division.

Antimony Mining Industry

Name	Address	Name of Mine	Location
NEW BRUNSWICK			
*Lake George Mines, Ltd.....	Minto.....	Lake George.....	Lake George.

Iron Mining Industry

QUEBEC			
Baie St. Paul Titanic Iron Ore Co.....	Baie St. Paul.....	.....	Baie St. Paul.

Molybdenum Mining Industry

QUEBEC			
*Molybdenite Reduction Co., Ltd.....	24 Rue St-Jacques, W., Montreal.	.....	Amos.

Nickel-Copper Mining Industry

ONTARIO			
International Nickel Co. of Canada, Ltd.	Dominion Bank Bldg., Toronto.	Creighton-Frood.....	Snider and McKim Tps.
Mond Nickel Co., Ltd.....	Coniston.....	Frood-Extension, Garson, Levack, Worthington.	McKim, Garson, Levack and Drury Tps.
*Falconbridge Nickel Mines, Ltd.....	407 Excelsior Life Bldg., Toronto, 2.	Falconbridge.....	Falconbridge and Garson Tps.
*McVittie-Graham Mines, Ltd.....	132 St. James St. W., Montreal, P.Q.	.....	Moose Lake.

Quicksilver Mining Industry

BRITISH COLUMBIA			
*Cartwright, C. E.....	509 Richards St., Vancouver.	Marion.....	Lillooet Dist.

Non-ferrous Smelting and Refining Industry

Name	Address	Location
QUEBEC		
Aluminum Co. of Canada, Ltd.....	46 King St. W., Toronto, Ont.....	Arvida.
Horne Copper Corporation.....	Rouyn.....	Rouyn.
ONTARIO		
Deloro Smelting and Refining Co., Ltd.....	Deloro.....	Deloro.
Kingdon Mining, Smelting and Manufacturing Co.	Galetta.....	Galetta.
International Nickel Co. of Canada, Ltd.....	Dominion Bank Bldg., Toronto.....	Copper Cliff.
Mond Nickel Co., Ltd.....	Coniston.....	Coniston.
BRITISH COLUMBIA		
Consolidated Mining and Smelting Co.....	Trail.....	Trail.
Granby Consolidated, Mining, Smelting and Power Co., Ltd.	Anyox.....	Anyox.

Silver-Cobalt Mining Industry

Name	Address	Name of Mine	Location
ONTARIO			
Brocklebank, Arthur.....	Box 929, Cobalt.....	Kerr Lake.....	Coleman Tp.
*Casey Mountain Operating Syndicate, Ltd.	411 McCallum-Hill Bldg., Regina, Sask.	Casey Mountain.....	Casey Tp.
Castle-Trethewey Mines, Ltd.....	602 Standard Bank Bldg., Toronto 2.	Castle-Trethewey.....	Haultain Tp.
Clemens, E. H.....	Box 687, Cobalt.....	Coniagas.....	
Cobalt Contact Mines, Ltd.....	8 Bloor St. E., Toronto.....	Contact.....	Bucke Tp.
Hudson Bay Mines, Ltd.....	New Liskeard.....	Hudson Bay.....	Cobalt.
Keeley Silver Mines, Ltd.....	52-302 Bay St., Toronto.....	Keeley.....	South Lorrain Tp.
*Kirk-Budd, Mining Co.....	Cobalt.....	Kirk-Budd.....	Cobalt Dist.
La Rose Mines, Ltd.....	36 King St., Toronto.....	La Rose.....	Cobalt.
Lorrain Trout Lake Mines, Ltd.....	350 Bay St., Toronto.....	Lorrain Trout Lake.....	Silver Centre.
*Millerest Mining Co., Ltd.....	204 McKinnon Bldg., Toronto 2	Millerest.....	Haultain Tp.
Mining Corporation of Canada, Ltd.....	350 Bay St., Toronto.....	Buffalo, Cobalt Lake, Townsite, Frontier Lorrain.....	Cobalt.
Nipissing Mines Co., Ltd.....	Excelsior Life Bldg., Toronto.	Nipissing.....	Silver Centre.
O'Brien, M. J., Ltd.....	816 Ottawa Electric Bldg., Ottawa.	O'Brien.....	Cobalt.
O'Brien, M. J., Ltd.....	816 Ottawa Electric Bldg., Ottawa.	Miller Lake O'Brien...	Coleman Tp.
Peterson Cobalt Mines, Ltd.....	301 Royal Bank Bldg., Toronto.	Peterson Cobalt.....	Gowganda Mining Division.
Sandoe and Moyle.....	Box 815, Cobalt.....	Temiskaming.....	Coleman Tp.
NOVA SCOTIA			
*Stirling Mines, Ltd.....	437 St. James St., Montreal, P.Q.	Stirling.....	Richmond Co.
QUEBEC			
*Adanac Mines Exploration, Ltd.....	111 Côte de la Montagne, Quebec.	.....	Montauban Tp.
British Metal Corporation, Ltd.....	437 St. James St., Montreal...	Tétreault.....	Montauban Tp.
*Clermont Mining Syndicate Inc.....	La Sarre, Abitibi.....	.....	Abitibi.
*Federal Zinc and Lead Co., Ltd.....	602 Drummond Bldg., Montreal.	Federal.....	Lemieux Tp.
*Lyall and Beidelman.....	602 Drummond Bldg., Montreal.	.....	Lemieux Tp.
*Montauban Metal Corporation.....	132 Rue St. Pierre, Quebec....	.....	Montauban.
New Montauban Zinc and Copper Syndicate.	33 Sous le toit, Quebec.....	.....	Portneuf Co.

*Operating but not producing.

Silver-Lead-Zinc Mining Industry

Name	Address	Name of Mine	Location
ONTARIO			
*Interprovincial Exploration Co., Ltd....	437 St. James St. W., Montreal, P.Q.	.....	Ben Nevis and McVittie Tps.
Kingdon Mining Smelting and Manufacturing Co., Ltd.	1122 Beaver Hall Hill, Montreal, P.Q.	Kingdon.....	Galetta.
*Summerville Lead Mines, Ltd.....	9 Ainslee St., Galt.....	Summerville.....	Victoria Co.
*Thunder Bay Lead and Zinc Co., Ltd.	Haileybury.....	.....	Dorion Tp.
*Towagmac Exploration Co., Ltd.....	921 New Birks Bldg., Montreal, P.Q.	Collins-Babson.....	Geneva.
Treadwell Yukon Co., Ltd.....	1018 Crocker Bldg., San Francisco, Cal., U.S.A.	Errington.....	Sudbury, Dist.
BRITISH COLUMBIA			
<i>Ainsworth Mining Division—</i>			
Berengaria Mining Co., Ltd.....	Riondel.....	Berengaria.....	Ainsworth.
Cork-Province Mines, Ltd.....	Kaslo.....	Cork-Province.....	Nashton.
Davys, M. L.....	Kaslo.....	Davys Mill.....	Ainsworth Mining Division.
Daybreak Mining Co., Ltd.....	Kaslo.....	Daybreak.....	Ainsworth Mining Division.
Giegerich, H.....	Kaslo.....	Banker, Maestro, Spokane Trinket.	Ainsworth.
Hansen, Thor B.....	R. D. No. 5 Spokane, Wash., U.S.A.	Tiger.....	Ainsworth.
Keene Mountain Gold and Silver Mines, Ltd.	311 Lancaster Bldg., Calgary, Alta.	White Eagle.....	Ainsworth Mining Division.
*Kootenay Florence Mining Co., Ltd.	Nelson.....	Kootenay Florence.....	Ainsworth Mining Division.
*Moris, Joseph.....	2405 W. Second Ave., Spokane, Wash., U.S.A.	Red Elephant.....	Hall Creek.
Sturgis Creek Mines, Ltd.....	501—1st St., West Calgary.	.....	Kaslo.
Silver Basin Mines, Ltd.....	Box 122, Kaslo.....	Jackson.....	Ainsworth.
*Wellington Mines, Ltd.....	Retallack.....	Wellington.....	Retallack.
Whitewater Mines, Ltd.....	Kaslo.....	Whitewater.....	Retallack.
<i>Fort Steele Mining Division—</i>			
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.....	St. Eugene Mill.....	Moyie.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.....	Sullivan.....	Kimberley.
<i>Golden Mining Division—</i>			
*Eichelberger, F.....	Field.....	Monarch and Kicking Horse.	Field.
*Pacific Mines Petroleum and Development Co., Ltd.	744 Hastings St. W., Vancouver.	Giant.....	Golden.
<i>Grand Forks Mining Division—</i>			
*Lightning Peak Mining Co.....	Trail.....	Lightning Peak.....	Grand Forks Mining Division.
<i>Greenwood Mining Division—</i>			
Beaver Silver Mines, Ltd.....	509 Union Bldg., Victoria.....	Beaver.....	Yale Dist.
Crowe-Swords, R. (Crescent Mines, Ltd.)	Greenwood.....	Crescent.....	Greenwood.
Highland Lass, Ltd.....	Box 782, Kelowna.....	Highland Lass, Highland Fraction.	Beaverdell.
*Inyo-Ackworth Mines, Ltd.....	45—615 Hastings St. W., Vancouver.	Inyo-Ackworth.....	Beaverdell.
*Lee, Robert.....	Box 585 Greenwood.....	Defrance.....	Providence.
Loomis Wilson Leasing Co.....	Greenwood.....	Providence.....	Greenwood.
McIntosh and Lee.....	Beaverdell.....	Bell.....	Wallace Mountain.
J. R. Mines, Ltd.....	715—402 Pender St., Vancouver.	.....	Greenwood Mining Division.
Sally Mines, Ltd.....	Box 220 Penticton.....	Sally.....	Beaverdell.
Stanhope, Philip B.S.....	Beaverdell.....	Bounty.....	Beaverdell.
T. T. Henderson and H. H. McCallum	Beaverdell.....	Duncan.....	Wallace Mountain.
Wellington Syndicate.....	Greenwood.....	Wellington.....	Beaverdell.
White, Brett, and Allen.....	Rossland.....	Elkhorn.....	Greenwood.
<i>Kamloops Mining Division—</i>			
*Cotton Belt Mines, Ltd.....	907 Vancouver Block, Vancouver.	Cotton Belt.....	Edgewood.
*Smuggler Hill Development Co., Ltd.	246 Victoria St., Kamloops...	Smuggler.....	Birch Island.
<i>Lardeau Mining Division—</i>			
Keene Mountain Gold and Silver Mines, Ltd.	311 Lancaster Bldg., Calgary, Alta.	Marquis and Gilbert...	Poplar.
*Multiplex Mining, Milling and Power Co., Ltd.	Beaton.....	.....	Camborne.
<i>Lilloet Mining Division—</i>			
*Mineral Mountain Mines, Ltd.....	612 Metropolitan Bldg., Vancouver.	Mineral Mountain.....	Anderson Lake.
<i>Nass River Mining Division—</i>			
*Kitsault-Eagle Silver Mines, Ltd.....	510 Hastings St. W., Vancouver.	Sunrise, Leroy, Silver Cord, Eagle.	Alice Arm.

*Operating but not producing.

Silver-Lead-Zinc Mining Industry—Concluded

Name	Address	Name of Mine	Location
<i>Nelson Mining Division—</i>			
Bystrom, Nels.	Nelson.	Catherine.	Nelson.
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail.	Hunter V.	Ymir.
*Howard Mines, Ltd.	Ymir.	Howard.	Porcupine Creek.
H. Jackson and L. McDonald.	Ymir.	Good Enough.	Wild Horse Creek.
*Reeves MacDonald Mines, Ltd.	London Bldg., Vancouver.	Reeves McDonald.	Salmo.
Yankee Girl Consolidated Mining Co., Ltd.	Nelson.	Yankee Girl, Goodenough Enterprise.	Ymir.
<i>Nicola Mining Division—</i>			
Thelma Mines, Ltd.	901 Credit-Foncier Bldg., Vancouver.	Thelma.	Suakum Mountain.
<i>Omineca Mining Division—</i>			
Duthie Mines, Ltd.	612 Pacific Bldg., Vancouver.	Duthie.	Smithers.
Hodgins, George R.	Hazelton.	Maple.	Glen Mountain.
*Lewis, Tom B.	910 Birks Bldg., Vancouver.	Mohawk.	New Hazelton.
*Mount Evelyn Mines, Ltd.	850 Hastings St. W., Vancouver.	Mount Evelyn.	Hudson Bay Mountains.
*Taltapin Mining Co., Ltd.	612 Vancouver Block, Vancouver.	Taltapin.	Burns Lake.
*Topley Richfield Mining Co., Ltd.	Smithers.	Topley Richfield.	Topley.
<i>Portland Canal Mining Division—</i>			
*Buena Vista Mining Co.	Trail.	Big Missouri.	Cascade River.
*Dunwell Mines, Ltd.	101 Pemberton Bldg., Victoria.	Dunwell.	Stewart.
*L and L Consolidated Mines.	Stewart.		Portland Canal Mining Division.
*Northern Light Mines, Ltd.	313 Crown Bldg., 615 Pender W., Vancouver.	Northern Light.	Cascade Creek.
Outland Silver Bar Mines, Ltd.	Bank of Nova Scotia Bldg., Vancouver.	Outland Silver Bar.	Stewart.
*Porter Idaho Mining Co., Ltd.	Premier.	Porter Idaho.	Cassiar Dist.
*Silverado Consolidated, Ltd.	Premier.	Silverado.	Cassiar Dist.
*Terminus Mines, Ltd.	611 Fort St., Victoria.	Terminus.	Bear River.
<i>Revelstoke Mining Division—</i>			
Snowflake Mining Co., Ltd.	418 Standard Bank Bldg., Vancouver.	Snowflake.	Albert Canyon.
*Wigwam Mining Co.	1217 Pacific Ave., Tacoma, Wash., U.S.A.	Wigwam.	Revelstoke.
<i>Skeena Mining Division—</i>			
Black Wolf Mining Co.	6125 Arcade Bldg., Seattle, Wash., U.S.A.	Black Wolf.	Maroon Mountain.
Toric Mines Co., Ltd.	1422 Standard Bank Bldg., Vancouver.	Toric.	Alice Arm.
<i>Slocan Mining Division—</i>			
*American Boy Mining Co.	Box 171 Sandon.	American Boy.	Sandon.
Ainslie, Ray F.	Silverton.	Westmount.	W. Kootenay.
*Black Coal Partners.	Box 371, New Denver.	Black Coal.	Slocan Mining Division.
British Columbia Development Co. (Pinto Mines, Ltd.).	318 Division St., Spokane, Wash., U.S.A.	Molly Hughes.	Slocan Lake.
Campbell, C. J.	New Denver.	Bosun.	New Denver.
Cullinane and Moline.	Rosland.	Meteor Group.	Slocan Mining Division.
Cunningham Mines, Ltd.	Alamo.	Alamo.	Alamo.
Cunningham Mines, Ltd.	Alamo.	Queen Bess.	Alamo.
Cunningham Mines, Ltd.	Alamo.	Van Roi.	Silverton.
Edstrom, Oscar.	New Denver.	Eagle.	Three Forks.
Erupec Mining Co., Ltd.	Yorkshire, Bldg., Vancouver.	Two Friends, Black Prince.	Slocan Mining Division.
Fred McDonnell and M. C. Vandergrift.	Silverton.	Buffalo.	Silverton.
Fred McDonnell and M. C. Vandergrift.	Silverton.	Lucky Thought.	Silverton.
Galena Farm Mine Partnership.	Box 2, Silverton.	Galena Farm.	Kootenay.
Gormley, George T.	Alamo.	Elkhorn.	Slocan.
Gormley, George T.	Alamo.	Monitor.	Three Forks.
J. Cechelero, M. Zattoni and L. Vigna.	New Denver.	Mountain Chief, Mammoth.	New Denver.
*J. M. Harris and F. T. Kelly.	Sandon.	Number One.	Sandon.
*Leadsmith Mines, Ltd.	Box 214, Spokane, Wash., U.S.A.	Noonday.	Sandon.
Lucky Jim Lead and Zinc Co., Ltd.	Box 122, Kaslo.	Lucky Jim.	Zincton.
*Mary Ryan Mines, Ltd.	431 Exchange Bank Bldg., Spokane, Wash., U.S.A.	Soho Group.	Kaslo.
Noble Five Mines, Ltd.	Nelson.	Noble Five.	Sandon.
Palmquist, E. A.	Slocan.	Dayton.	Springer Creek.
Petty, Geo. A.	Sandon.	Victor.	Sandon.
Piedmont Mines, Ltd.	Box 95, Nelson.	Hope Number Two.	Lemon Creek.
Roseberry Surprise Mining Co., Ltd.	New Denver.	Monitor.	Three Forks.
Roseberry Surprise Mining Co., Ltd.	New Denver.	Bosun.	New Denver.
Ruth-Hope Mining Co., Ltd.	717 Vancouver Block, Vancouver.	Ruth-Hope.	Sandon.
Silversmith Mines, Ltd.	Box 1772, Spokane, Wash.	Silversmith.	Sandon.
*Slocan Rambler Mining Co., Ltd.	Nelson.	Slocan Rambler.	Silverton.

*Operating but not producing.

DOMINION BUREAU OF STATISTICS

Silver-Lead-Zinc Mining Industry

Name	Address	Name of Mine	Location
<i>BRITISH COLUMBIA—Concluded</i>			
Slocan Silver Mines, Ltd.....	Alamo.....	McAllister.....	Three Forks.
Victoria Syndicate, Ltd.....	Kaslo.....	Hewitt, and Carnation.....	Sandon.
Western Exploration Co., Ltd.....	Silverton.....	Mammoth and Standard.....	Silverton.
Zimmeran, K. E.....	Slocan.....	Anna.....	Springer Creek.
<i>Vernon Mining Division—</i>			
Ophir Mining Co.....	337 Burke Bldg., Seattle Wash., U.S.A.	Ophir.....	Lake Okanogan.
<i>Windermere Mining Division—</i>			
Galena Ghat Mines, Ltd.....	Stettler, Alta.....	White Cat Group.....	Windermere.
Victoria Syndicate Ltd.....	Box 122, Kaslo.....	Paradise.....	Lake Windermere.
<i>W. Kootenay Mining Division—</i>			
True Fissure Milling and Mining Co.	1001 Traction Bldg., Cincin- nati, Ohio, U.S.A.	True Fissure.....	Ferguson.
YUKON			
Bjornes, Ellef.....	Keno.....	Eureka.....	Sourdough Hill.
Gordon and Moreau.....	Keno.....	Whipsaw.....	Sourdough Hill.
Johnson, Andrew.....	Mayo.....	Ram.....	Sourdough Hill.
Keno Hill, Ltd.....	3517-120 Broadway, New York, N.Y., U.S.A.	Keno Hill.....	Mayo Division.
<i>McKay, McIver, Formo, and Mackintosh</i>			
Treadwell Yukon Co., Ltd.....	Keno Hill.....	Shamrock.....	Keno Hill.
	1022 Crocker Bldg., San Fran- cisco, Cal., U.S.A.	Treadwell, Yukon.....	Mayo Division.

Tungsten Mining Industry

NOVA SCOTIA			
*Indian Path Gold Prospecting Syndicate.	464 Barrington St., Halifax....	Indian Path.....	Lunenburg Co.

NON-METAL MINING INDUSTRIES INCLUDING FUELS

FUELS

Coal Mining Industry

Name	Address	Location
<i>District</i>		
NOVA SCOTIA—		
Acadia Coal Co., Ltd.	Stellarton	Pictou.
Boston Coal Co.	River Hebert	Cumberland.
Bras d'Or Coal Co.	Little Bras d'Or Bridge	Cape Breton.
Burke, Herbert and White (formerly Canadian Coal Co., Ltd.)	Halifax	Cumberland.
Cumberland Railway and Coal Co.	Glace Bay	Cumberland.
Dominion Coal Co., Ltd.	Glace Bay	Cape Breton.
Enterprise Coal Co., Ltd. (formerly Lawson Coal Co.)	Maccan	Cumberland.
Greenwood Coal Co., Ltd.	Thorburn	Pictou.
Indian Cove Coal Co., Ltd.	Sydney Mines	Cape Breton.
Intercolonial Coal Mining Co., Ltd.	Westville	Pictou.
Inverness Railway and Coal Co.	Inverness	Inverness.
Maritime Coal, Railway and Power Co., Ltd.	Joggins Mines	Cumberland.
Nova Scotia Steel and Coal Co.	Sydney Mines	Cape Breton.
River Hébert Coal Co.	River Hébert	Cumberland.
Standard Coal Co., (formerly Emerson Coal Co., Ltd.)	River Hébert	Cumberland.
Victoria Coal Co., Ltd. (operating No. 2 Mine, Minudie Coal Co.)	River Hébert	Cumberland.
NEW BRUNSWICK—		
Avon Coal Co., Ltd.	St. John	Queens.
Chipman Coal Co. (formerly Burpee Construction Co.)	Devon	Queens.
Evans, W. B. (formerly Rothwell Coal Co., Ltd.)	Rothwell	Queens.
Minto Coal Co., Ltd.	St. John	Queens.
Miramichi Lumber Co., Ltd.	Minto	Queens.
Welton, Harvey	Minto	Queens.
Welton and Henderson	Minto	Queens.
SASKATCHEWAN—		
<i>Municipality</i>		
Bienfait Commercial Co.	Bienfait	Near Bienfait.
Bienfait Mine	Bienfait	Near Bienfait.
Big Lump Coal Co. (formerly Bourguin and Smith)	Estevan	Near Estevan.
Bourguin, Louis	Estevan	Near Estevan.
Crescent Collieries, Ltd.	Bienfait	Near Bienfait.
Eastern Collieries of Bienfait, Ltd.	Estevan	Near Estevan.
International Clay Products, Ltd.	Estevan	Near Estevan.
Lignite Coal Mines, Ltd. (formerly Andrew A. Miller)	Taylorlton	Taylorlton.
Manitoba and Saskatchewan Coal Co., Ltd.	503 Avenue Block, Winnipeg, Man.	Bienfait.
Nicholson, H.	Estevan	Estevan.
Parkinson, Geo.	Estevan	Near Estevan.
Rollinson, W. H.	Estevan	Estevan.
Shand Coal and Brick Co.	Shand	Shand.
Western Dominion Collieries, Ltd.	305 Trust and Loan Bldg., Winnipeg, Man.	Taylorlton.
ALBERTA—		
<i>District</i>		
<i>Bituminous—</i>		
Blue Diamond Coal Co., Ltd.	Brulé Mines	Brulé.
Brazeau Collieries, Ltd.	Nordegg	Nordegg.
Cadomin Coal Co., Ltd.	282 Main St., Winnipeg, Man.	Mountain Park.
Canmore Coal Co., Ltd.	Canmore	Cascade.
Hillcrest Collieries, Ltd.	Hillcrest	Crownst.
International Coal and Coke Co., Ltd.	Coleman	Crownst.
Luscar Collieries, Ltd.	Luscar	Mountain Park.
McGillivray Creek Coal and Coke Co., Ltd.	Coleman	Crownst.
Mohawk Bituminous Mines, Ltd.	Calgary	Crownst.
Mountain Park Collieries, Ltd.	708 Tegler Bldg., Edmonton	Mountain Park.
West Canadian Collieries, Ltd.	Blairmore	Crownst.
<i>Sub Bituminous—</i>		
Alexo Coal Co., Ltd.	Alexo	Saunders.
Bighorn and Saunders Creek Collieries, Ltd.	Saunders	Saunders.
Bryan Coal Co., Ltd.	Adams Bldg., Edmonton	Coalspur.
Coalspur Collieries, Ltd.	710 McLeod Bldg., Edmonton	Coalspur.
Coal Valley Mining Co., Ltd.	806 McLeod Bldg., Edmonton	Coalspur.
Confederation Coal Co., Ltd. (formerly Northern Alberta Mines, Ltd.)	104 C.P.R. Bldg., Edmonton	Coalspur.
Melrose Coal Co. (formerly Elkhead Collieries, Ltd.) also (Reco Hard Coal Co., Ltd.)	Reco	Coalspur.
Foothills Collieries, Ltd.	222 Portage Ave., Winnipeg, Man.	Coalspur.
Lakeside Coal Co., Ltd. (formerly Balkan Coal Co., Ltd.)	Robb	Coalspur.

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Concluded		
McLeod River Collieries (formerly Saunders Ridge Coal Co., Ltd.)	Mercoal	Coalspur.
Saunders West Collieries, Ltd. (formerly Stanley, C. H.)	West Saunders	Saunders.
Sterling Collieries, Ltd.	913 McLeod Bldg., Edmonton.	Coalspur.
Lignite—		
Alberta Block Coal Co., Ltd.	Drumheller	Drumheller.
Anderson, W. J.	Sheerness	Sheerness.
Atlas Coal Co., Ltd.	Drumheller	Drumheller.
Big Valley Collieries, Ltd.	Big Vally	Big Valley.
Big Valley Power and Mining Co., Ltd. (formerly Griffith and Scott)	Big Valley	Big Valley.
Bush Mines, Ltd.	1024-101A Avenue, Edmonton.	Edmonton.
Cadillac Coal Co., Ltd. (formerly Donaldson, C. S. Coal Co.)	Suite 1, Hill Block, Lethbridge.	Lethbridge.
Caledonian Collieries, Ltd.	Drumheller	Drumheller.
Canadian Dinant Coal Co.	Dinant	Camrose.
Canadian Pacific Railway Co.	Department of Natural Resources, Calgary	Lethbridge.
Cardiff Coal Co.	35 Dominion Bank Bldg., Edmonton	Edmonton.
City of Lethbridge Coal Mines	Lethbridge	Lethbridge.
Coal Producers, Ltd.	Evansburg	Pembina.
Consolidated Diamond Collieries, Ltd.	Lethbridge	Lethbridge.
Co-Operative Coal Co.	Barnwell	Taber.
Craig Coal Co., Ltd.	Drumheller	Drumheller.
Dawson Coal Co., Ltd.	7 McDougall Court, Edmonton	Edmonton.
Dobell Coal Co., Ltd.	138 St. Peter St., Quebec, P.Q.	Tofield.
Eastern Alberta Coal Mines, Ltd.	Edmonton	Tofield.
Elgin Coal Co., Ltd.	Drumheller	Drumheller.
Ellis Coal Co., Ltd.	Three Hills	Carbon.
Excelsior Collieries, Ltd.	Wayne	Drumheller.
Fox Coal Co. (formerly Carbon Gem Mine Co.)	Carbon	Carbon.
Fraser McKay Collieries, Ltd.	10055-101st. St., Edmonton	Edmonton.
Great West Coal Co., Ltd. (Black Diamond Mine)	11026-101st. St., Edmonton	Edmonton.
Great West Coal Co., Ltd. (Star Mine)	Aerial	Drumheller.
Hy-Grade Coal Co.	Drumheller	Drumheller.
Ideal Coal Co., Ltd.	Wayne	Drumheller.
Jewel Collieries, Ltd.	Wayne	Drumheller.
Keith and Fulton Coal Co., Ltd.	Clover Bar	Drumheller.
Lakeside Coals, Ltd.	711 Tegler Bldg., Edmonton	Edmonton.
Leblanc, Emile (formerly Bay Coal Co., Ltd.)	Taber	Pembina.
Majestic Mines, Ltd. (formerly Leland Coal Co., Ltd.)	Taber	Taber.
Marcus Coal Mines, Ltd.	10366-104th St., Edmonton	Edmonton.
Midland Coal Mining Co., Ltd.	Midlandvale	Drumheller.
Mid-West Collieries, Ltd.	Drumheller	Drumheller.
Minute Mine	Drumheller	Drumheller.
Monogram Coal Co.	Rosedale	Drumheller.
Murray Collieries, Ltd.	Rosedale	Drumheller.
Newcastle Coal Co., Ltd.	Drumheller	Drumheller.
Newcastle Junior Mining Co.	Drumheller	Drumheller.
Olyphant, J. H.	420-7th St., Medicine Hat	Carbon and Redcliff.
Ontalta Collieries, Ltd. (formerly Capital Collieries, Ltd.)	Rosedale Station, Drumheller	Drumheller.
Ottewell Coal Co.	Clover Bar	Edmonton.
Palisade Coal Mining Co., Ltd.	Three Hills	Carbon.
Peerless Carbon Coal Mines, Ltd.	Carbon	Carbon.
Penn Mine Coal Co., Ltd. (formerly Crown Coal Co.)	10651-92nd St., Edmonton	Edmonton.
Penn Mines, Ltd. (formerly Edmonton Collieries, Ltd.)	Fraser Flats, Edmonton	Edmonton.
Premier Coal Co., Ltd. (formerly Reed and Brown)	109th Avenue, Edmonton	Edmonton.
Redcliff Brick and Coal Co., Ltd.	Redcliff	Redcliff.
Rosedale Coal Co., Ltd.	Rosedale	Drumheller.
Rose Deer Coal Mining Co., Ltd.	Wayne	Drumheller.
Royal Lethbridge Collieries	Box 5, Lethbridge	Lethbridge.
Shannon Coal Co., Ltd.	Carbon	Carbon.
Sovereign Coal Mining Co., Ltd. (formerly Western Commercial Co., Ltd.)	Wayne	Drumheller.
Stoney Creek Collieries, Ltd.	Camrose	Camrose.
Sturgeon Valley Collieries, Ltd.	Carbondale	Edmonton.
Sun Coal Co., Ltd. (formerly North Star Coal Co.)	Cardiff	Edmonton.
Sunbeam Coal Co., Ltd. (formerly Challenger Coal Co., Ltd.)	Ardley	Ardley.
Superior Grade Coal Co., Ltd.	Wayne	Drumheller.
Thomas, J. D., Coal Co.	Nacmine	Drumheller.
Tofield Coal Co., Ltd.	Tofield	Tofield.
Walsh, W. R. (formerly Parker Creek Collieries, Ltd., also Ardley Hardite Collieries, Ltd.)	Ardley	Ardley.
Warneboldt, Julius	Sheerness	Sheerness.
Western Gem Coal Co., Ltd.	Drumheller	Drumheller.

Coal Mining Industry—Concluded

Name	Address	Location
BRITISH COLUMBIA—		
Canadian Collieries (Dunsmuir), Ltd.....	600 Belmont Bldg., Victoria.....	Island.
Coalmont Collieries, Ltd.....	Coalmont.....	Inland.
Corbin Coals, Ltd.....	Corbin.....	Crow's Nest Pass.
Crow's Nest Pass Coal Co.....	Fernie.....	Crow's Nest Pass.
East Wellington Coal Co.....	600 Belmont House, Victoria.....	Island.
Granby Consolidated Mining, Smelting and Power Co., Ltd.....	Cassidy.....	Island.
Lynden Coal Mines, Ltd.....	Princeton.....	Inland.
Middlesboro Collieries, Ltd.....	Merritt.....	Inland.
Tulameen Valley Coal Mine.....	Princeton.....	Inland.
Western Fuel Corporation of Canada, Ltd.....	Nanaimo.....	Island.

Natural Gas Industry

NEW BRUNSWICK—		
New Brunswick Gas and Oilfields, Ltd.....	Box 196, Moncton.....	<i>Field</i> Stoney Creek, Albert Co.
ONTARIO—		
Ajax Oil and Gas Co.....	501 Federal Bldg., Toronto.....	Dover W.
Allen, J. D.....	Lowbanks.....	Moulton.
Beer, Geo.....	Binbrook.....	Binbrook.
Benn, A. S.....	Hagersville.....	Walpole.
Binbrook Gas Co.....	Binbrook.....	Binbrook.
Border Cities Syndicate.....	47 Elgin St., Brantford.....	Onondaga.
Canada Cement Co., Ltd.....	Box 29, Montreal, Que.....	Wainfleet.
Canboro Gas and Oil Co.....	Selkirk.....	Canboro, Cayuga N. and Seneca.
Canby, B. F.....	R. R. No. 2, Wainfleet.....	Wainfleet.
Canfield Natural Gas Co., Ltd.....	Canfield.....	Cayuga N.
Castle Oil and Gas Co.....	Imperial Bank Chambers, Niagara Falls.....	Euphemia.
Chippewa Development Co., Ltd.....	Chippewa.....	Willoughby.
Cliff Gas Co., Ltd.....	Welland.....	Moulton, Canboro.
Coleman, J. A.....	Wellandport.....	Wainfleet, Gainsboro.
Dominion Natural Gas Co., Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Binbrook, Bayham, Canboro, Caistor, Charlotteville, Cayuga N., Cayuga S., Dunn, Delhi, Gleanford, Houghton, Middleton, Malahide, Moulton, Onondaga, Oneida, Port Rowan, Port Dover, Rainham, Seneca, Walpole, Walsingham S., Walsingham, N., Windham, Woodhouse, Townend.
Dunn Natural Gas Co., Ltd.....	Dunnville.....	Dunn and Sherbrooke.
Eastside Gas Co.....	R. R. 2, Lowbanks.....	Sherbrooke.
Ellsworth, F.....	Box 391, Pt. Colborne.....	Wainfleet.
Erie Gas and Oil Co.....	Fisherville.....	Rainham.
Fisherville Gas Co.....	Fisherville.....	Rainham.
Fisherville Gas Co., No. 2.....	Fisherville.....	Rainham.
Fletcher, J. D.....	R. R. 1, Hannon.....	Binbrook.
Gifford, Arthur and Son.....	R. R. 2, Cayuga.....	S. Cayuga.
Haldimand Gas Fields Syndicate.....	Cayuga.....	Rainham.
Hart and Harrington.....	Dunnville.....	Rainham.
Held, Fred.....	Fisherville.....	Rainham.
Hill, A. W.....	Coatsworth.....	Tilbury E.
Hoffman, Albert.....	R. R. 2, Dunnville.....	Moulton.
Industrial Natural Gas Co., Ltd.....	Thorold.....	Bertie, Crowland, Humberstone.
Jasperson, B.....	Kingsville.....	Gosfield South and Tilbury E.
Jones, J. S.....	Port Maitland.....	Dunn.
Kindy, D. and Son.....	Selkirk.....	Rainham.
Lincoln Gas Co., Ltd.....	Grimsby.....	Gainsboro, Canboro, Caistor.
Medina Natural Gas Co., Ltd.....	215 King St. W., Chatham.....	Bayham, Houghton and Middleton.
Michener, E. L.....	Wainfleet.....	Wainfleet.
Midfield Natural Gas Co., Ltd.....	421 King St. E., Hamilton.....	N. Cayuga and Oneida.
Nesbitt, O. L.....	Dunnville.....	Moulton.
Nelles Corners Gas Syndicate.....	Nelles Corners.....	Cayuga N. and Rainham.
New Azoff Gas Co., Ltd.....	Canboro.....	Cayuga N.
Niece Hosea and Son.....	R. R. 2, Lowbanks.....	Sherbrooke.
Northern Gas and Gasoline Co.....	Hepworth.....	Anabel.
North Shore Gas Co., Ltd.....	Selkirk.....	Rainham.
Oil Springs Oil and Gas Co., Ltd.....	Oil Springs.....	Eniskillen.
Ontario Salt Co., Ltd.....	Hamilton.....	Dorchester N.
Patterson, W. C.....	Jamestown, N.Y., U.S.A.....	Cayuga N., Cayuga S. and Dunn.

Natural Gas Industry—Concluded

Name	Address	Location
ONTARIO—Concluded		
Petrol Oil and Gas Co., Ltd.	301 York Bldg., Toronto	Dover West.
Pilkington Bros. (Canada), Ltd.	17 Mercer St., Toronto 2	Crowland.
Port Colborne-Welland Natural Gas and Oil Co., Ltd.	Port Colborne	Oneida, Onondaga and Seneca.
Provincial Natural Gas and Fuel Co., of Ontario, Ltd.	Niagara Falls	Bertie, Crowland, Humberstone and Willoughby.
Rainham Gas and Oil Syndicate	Fisherville	Rainham.
Sarnia Gas and Oil Co.	Sarnia	Sarnia.
Schram and Saunders	Welland	Moulton.
Smith, R. H.	Lowbanks	Moulton.
South Cayuga Gas Syndicate	R.R. 2, Cayuga	Cayuga S.
Southern Ontario Gas Co., Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Mersea, Raleigh, Romney and Tilbury East.
Springvale Gas and Oil Co., Ltd.	Hagersville	Walpole.
Sterling Gas Co., Ltd.	Port Colborne	Humberstone, Moulton, Sherbrooke and Wainfleet.
Stevensville Natural Gas and Fuel Co.	Stevensville	Bertie.
Sundy Gas Well Co.	Dunnville	Canboro.
Union Natural Gas Co. of Canada, Ltd.	52 Fifth St., Chatham	Tilbury E., Romney, Raleigh, Dover, Dawn.
United Gas Companies, Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Canboro, Cayuga N., Moulton, Seneca, Wainfleet.
Vacuum Gas and Oil Co., Ltd.	701 Federal Bldg., Toronto	Middleton.
Van Sickle, A. W.	Onondaga	Onondaga.
Wainfleet-Moulton Gas Co.	R.R. 1, Lowbanks	Moulton and Wainfleet.
MANITOBA—		
Bosc, Francois.	Rathwell	Rathwell.
Haskill, E. C.	Box 64, Treherne	Treherne.
ALBERTA—		
Alberta Clay Products Co., Ltd.	Box 672, Medicine Hat	Medicine Hat.
Bow Island Gas Plant	Bow Island	Bow Island.
Canada Cement Co., Ltd.	Canada Cement Co., Bldg., Montreal, P.Q.	Dauntless.
Canadian Pacific Railway Co.	Montreal, P.Q.	Medicine Hat.
Canadian Western Natural Gas Light, Heat and Power Co., Ltd.	215-6th Ave. W., Calgary	Bow Island, Brooks, Barnwell, Foremost and Turner Valley.
Canadian Western Power and Fuel Co., Ltd.	Redcliff	Redcliff.
Dalhousie Oil Co., Ltd.	608-2nd St. W., Calgary	Turner Valley.
Dominion Glass Co., Ltd.	1111 Beaver Hall Hill, Montreal, P.Q.	Redcliff.
Foothills Oil and Gas Co., Ltd.	56 Church St., Toronto, Ont.	Turner Valley.
Gypsy Oil, Ltd.	636 Tegler Bldg., Edmonton	Wainwright.
Higgins, W. F.	Suffield	Suffield.
Home Oil Co.	606-2nd St. W., Calgary	Turner Valley.
Illinois-Alberta Oils, Ltd.	211 Lancaster Bldg., Calgary	Turner Valley.
Maple Leaf Oil Co., Ltd.	702-543 Granville St., Vancouver, B.C.	Wainwright.
Maple Leaf Milling Co., Ltd.	Toronto, Ont.	Medicine Hat.
McLeod Oil Co., Ltd.	507 Grain Exchange, Calgary	Turner Valley.
Medicine Hat Brick and Tile Co., Ltd.	Medicine Hat	Medicine Hat.
Medicine Hat, Corporation of.	Medicine Hat	Medicine Hat.
Northwestern Utilities, Ltd.	10305 Jasper Ave., Edmonton	Viking.
Ogilvie Flour Mills Co., Ltd.	Montreal, P.Q.	Medicine Hat.
Okalta Oils, Ltd.	1015-Herald Bldg., Calgary	Turner Valley.
Redcliff Brick and Coal Co., Ltd.	Box B 5, Redcliff	Redcliff.
Royalite Oil Co., Ltd.	602-2nd St. W., Calgary	Turner Valley.
Spooner Oils, Ltd.	902 Lancaster Bldg., Calgary	Turner Valley.
Vulcan Oils, Ltd.	Vulcan	Turner Valley.
Wainwell Oils, Ltd.	114 Union Trust Bldg., Toronto, Ont.	Turner Valley.
Wetaskiwin, Corporation of.	Wetaskiwin	Wainwright.
W inwright Gas Co., Ltd.	36 Dominion Bank Bldg., Edmonton	Wetaskiwin.
United Electric and Engineering Co., Ltd.	721-11th St. W., Calgary	(Distributing Company). Bassano.

Petroleum Industry

		Field
NEW BRUNSWICK—		
New Brunswick Gas and Oilfields, Ltd.	Box 196, Moncton	Stoney Creek, Albert County.
ONTARIO—		
Ajax Oil and Gas Co., Ltd.	85 Richmond St. W., Toronto	Thamesville.
Anderson Bros. and Thompson	Oil Springs	Oil Springs.
Anderson, J. H.	Oil Springs	Oil Springs.
Armstrong, J. E.	Petrolia	Enniskillen.
Atkinson, John	R.R. 3, Petrolia	Enniskillen.
Atkinson, Wm.	R.R. 3, Petrolia	Plympton.
Bradley, R. N.	Lowbanks	Enniskillen.
Barrett, C. H.	Petrolia	Enniskillen.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—Continued		
Brock, T. A.	Petrolia.	Enniskillen.
Baker, Jas.	R. R. 3, Petrolia.	Enniskillen.
Bailey, John.	Petrolia.	Moore.
Bowles, Herbert.	Petrolia.	Sarnia.
Brown, W. J.		Moore.
Bernelle, Thos.	Petrolia.	Moore.
Bruce, A.		Moore.
Chesher, Geo.	Petrolia.	Sarnia.
Byers, Lydia.	Oil Springs.	Oil Springs.
Canada Crude Oil Producers, Ltd.	Petrolia.	Petrolia.
Carleton, W. G.	R. R. 2, Petrolia.	Enniskillen.
Carman and Fairbank.	Petrolia.	Bothwell.
Collins, Thos.	Petrolia.	Petrolia.
Crocker-Parks Oil Co., Ltd.	Oil Springs.	
Coulter, James.	R. R. 3, Petrolia.	Moore.
Crotty, and Elliott.	Bothwell.	Bothwell.
Dennes, E.	Petrolia.	Plympton.
Dennis, C.	Oil Springs.	Oil Springs.
Duncan, Bros.	R. R. No. 3, Petrolia.	Moore.
Deacon, F. W.	Petrolia.	Petrolia.
Dominion Petroleum Co., Ltd.	Glencoe.	Mosa.
Drope, Geo.	R. R. 4, Copelston.	Enniskillen.
Donald, Geo.	Oil Springs.	Oil Springs.
Ewart, Jas.	R. R. 1, Wyoming.	Plympton.
Edward, F. H.	Box 125, Petrolia.	Enniskillen.
Elliott, C. H.	Corunna.	Sarnia.
Elliott, Henry.	Petrolia.	Moore.
Elliott, K. G.	R. R. 2, Sarnia.	Enniskillen.
Forsythe, A.	Copelston.	Petrolia and Enniskillen.
Gregory, Henry.	Petrolia.	Enniskillen.
Griffin, Geo. B.	R. R. 1, Sarnia.	Sarnia.
Gillespie, Wm.	Petrolia.	Petrolia.
Goudie, John.	Petrolia.	Enniskillen.
Houston, Mrs. Annie.	Petrolia.	Petrolia.
Heal, John.	Petrolia.	Moore.
Hastie, Wm.	R. R. 2, Sarnia.	Sarnia.
Hillis, J. T. & Sons.	Oil Springs.	Oil Springs.
Howlett, Fred.	Petrolia.	Petrolia.
Halliday, Henry.	R. R. 2, Sarnia.	Sarnia.
Hardy, Chas.	R. R. 2, Sarnia.	Sarnia.
Hamlin, F. G.	Petrolia.	Petrolia.
Jewell, Dan.	Oil Springs.	Oil Springs.
Johns, Wm.	Wyoming.	Plympton.
Josh, Thos.		Enniskillen.
Kerr, John, Estate.	Petrolia.	Petrolia and Enniskillen.
Kettle, Robt.	Petrolia.	Enniskillen.
Kirk, Elmer.	Petrolia.	Moore.
Kelly, J. E.	Box 706, Petrolia.	Petrolia and Enniskillen.
Kerr, Mrs. Ross.	Sarnia.	Enniskillen.
Levine, Herbert.	Petrolia.	Petrolia and Enniskillen.
Levitt, C.	Wyoming.	Plympton.
Lewis, J. J., Estate.	Oil Springs.	Oil Springs.
Lammy, H.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Logan, Herbert.	Petrolia.	Petrolia and Enniskillen.
Logan, Leslie.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Loxton, Thos.	Petrolia.	Petrolia and Enniskillen.
Maw, F. W.	Petrolia.	Petrolia and Enniskillen.
McAlpine, T. A.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
McDonald, F. D.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
McDougall, D.	Petrolia.	Petrolia and Enniskillen.
McGaffey, Richard.	Bothwell.	Bothwell.
McGillivray, Geo. A.	201 Mt. Pleasant Ave., London.	Oil Springs.
McKay, John.	Sarnia.	Sarnia.
McLellan, Walter.	R. R. 3, Petrolia.	Moore.
McManus, Alex.	Wyoming.	Plympton.
McNaughton, J. D.	R. R. 2, Newbury.	Mosa.
McRitchie, C. and A.	Bothwell.	Bothwell.
Miller, F. J.	R. R. 2, Sarnia.	Sarnia.
Miller, W. W.	R. R. 3, Petrolia.	Moore.
Mills, A. J.	Corunna.	Sarnia.
Mitchell, Wesley.	Sarnia.	Sarnia.
Morningstar, L. H.	Oil Springs.	Oil Springs.
Morningstar and Jackson.	Oil Springs.	Oil Springs.
Morris, Geo.	Petrolia.	Petrolia and Enniskillen.
Mott and Mitchell.	Oil Springs.	Oil Springs.
Mott, Ed. J.	Oil Springs.	Oil Springs.
Montgomery, Thos.	Petrolia.	Petrolia and Enniskillen.
Mutual Oil Producing Co.	195 Dundas St., London.	Petrolia.
Napper, Fred.	Petrolia.	Petrolia and Enniskillen.
Ontario Lands and Oil Co., Ltd.	Petrolia.	Petrolia and Enniskillen.
Osborne Oil Producers, Ltd.	Petrolia.	Moore.
Owen, R. H.	Petrolia.	Petrolia and Enniskillen.
Parks, Mrs. E. M.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Plumb, J. F.	Petrolia.	Petrolia and Enniskillen.
Portsmouth, T.	Petrolia.	Petrolia and Enniskillen.

Petroleum Industry—Concluded

Name	Address	Location
ONTARIO—Concluded		
Petrol Oil and Gas Co., Ltd.	307 York Bldg., Toronto.	Dover, W. <i>Field</i>
Rainsberry, N. J.	Petrolia.	Sarnia.
Rainsberry, Walter	Petrolia.	Petrolia and Enniskillen.
Rawson, A.	Petrolia.	Petrolia and Enniskillen.
Rawson, Wallace	R.R. 3, Petrolia.	Plympton.
Richardson, Geo.	Wyoming.	Plympton.
Redick, W. O.	R.R. 3, Petrolia.	Sarnia.
Ruckle, H.	Petrolia.	Petrolia and Enniskillen.
Schumacher, Bowen E.	112 Adams St., Chicago, Ill., U.S.A.	Sarnia.
Smith, T. E.	R.R. 2, Sarnia.	Petrolia and Enniskillen.
Sproule Bros.	Oil Springs.	Oil Springs.
Stevenson, L.	Petrolia.	Petrolia and Enniskillen.
Stonehouse Bros.	Petrolia.	Moore.
Summit Oil Co.	610 Union Trust Bldg., Rochester N.Y., U.S.A.	Bothwell.
Tuer, J.	Wyoming.	Plympton.
Vacuum Gas and Oil Co.	85 Richmond St., Toronto.	Thamesville.
Wallen, Alex C.	Oil Springs.	Oil Springs.
Wallen, John, Estate	Oil Springs.	Oil Springs.
Wallen and Wallen, Estate	Oil Springs.	Oil Springs.
Walsh, T.	Petrolia.	Petrolia and Enniskillen.
Walker Oil and Gas Co., Ltd.	129 Chatham St. W., Windsor	Bothwell.
Warwick, Joseph	Oil Springs.	Oil Springs.
Watt, P. J.	London.	Petrolia and Enniskillen.
Willits, Geo. E.	Bothwell.	Bothwell.
Winnett, J. W. G.	Bothwell.	Bothwell.
Woodward, John	Oil Springs.	Oil Springs.
Woodward, Wm.	Oil Springs.	Oil Springs.
Yerkes, Carl	Petrolia.	Petrolia and Enniskillen.
Young, W. E.	Wyoming.	Plympton.
SASKATCHEWAN—		
<i>Drilling—</i>		
Rosetown Leaseholding Developing Co.	Rosetown.	Mountain View.
Simpson Oil Co., Ltd.	Simpson.	Simpson.
Unity Valley Oil Co., Ltd.	207 Lancaster Bldg., Calgary.	Unity Valley.
ALBERTA—		
<i>Producing—</i>		
Dalhousie Oil Co.	606-2nd St. W., Calgary.	Turner Valley.
Foothills Oil and Gas Co., Ltd.	606-2nd St. W., Calgary.	Turner Valley.
Gypsy Oils, Ltd.	636 Tegler Bldg., Edmonton.	Wainwright.
Home Oil Co., Ltd.	606-2nd St. W., Calgary.	Turner Valley.
Illinois-Alberta Oils, Ltd.	211 Lancaster Bldg., Calgary.	Turner Valley.
McLeod Oil Co., Ltd.	507 Grain Exchange, Calgary.	Turner Valley.
New McDougall-Segur Oil Co., Ltd.	38 Union Bldg., Calgary.	Turner Valley.
Okalta Oils, Ltd.	1015 Herald Bldg., Calgary.	Turner Valley.
Royalite Oil Co., Ltd.	606-2nd St. W., Calgary.	Turner Valley.
Spooner Oils, Ltd.	902 Lancaster Bldg., Calgary.	Turner Valley.
Vulcan Oils, Ltd.	Vulcan.	Turner Valley.
Wainwell Oils, Ltd.	114 Union Trust Bldg., Toronto, Ont.	Wainwright.
ALBERTA—		
<i>Drilling—</i>		
Advance Oil Co., Ltd.	521 P. Burns Bldg., Calgary.	Turner Valley.
British Dominion Oil and Development Corporation, Ltd.	211 Dominion Bank Bldg., Calgary.	Turner Valley.
Calmont Oils, Ltd.	400 Lancaster Bldg., Calgary.	Turner Valley.
Commonwealth Petroleum, Ltd.	410 Lancaster Bldg., Calgary.	Milk River Dome.
Devenish Petroleum, Ltd.	300 Leeson-Lineham Block, Calgary.	Skiff.
Dutch America Oils, Ltd.	303 Maclean Block, Calgary.	Turner Valley.
Eagle Butte Oil Co., Ltd.	Medicine Hat.	Cypress Hills.
Fabyan Petroleum, Ltd.	418 Pacific Bldg., Vancouver.	Wainwright.
Great West Oils, Ltd.	3 Alberta Block, Calgary.	Turner Valley.
Lethalta Oils, Ltd.	Lethbridge.	Bow Island.
London Ribstone Petroleum, Ltd.	736 Granville St., Vancouver.	Ribstone.
Madison Oils, Ltd.	815 Centre St., Calgary.	Turner Valley.
Marquis of Anglesey	De Winton.	De Winton.
Mayland Oil Co., Ltd.	803 Lancaster Bldg., Calgary.	Turner Valley.
Melbourne Oil Co., Ltd.	305 P. Burns Bldg., Calgary.	Stoney Reserve.
Mid-Canada Oils, Ltd.	Edmonton.	Wainwright.
Model Oils, Ltd.	Suite 8, Cameron Block, Calgary.	Turner Valley.
New Valley Oil Co., Ltd.	206 Alberta Corner, Alberta.	New Valley.
Northwest Co., Ltd.	606-2nd St. W., Calgary.	Highwood and Bow River.
Ranchmen's Gas and Oil Co., Ltd.	509 Grain Exchange Bldg., Calgary.	Alberta Dome.
Range Oil and Gas Co., Ltd.	914 Lancaster Bldg., Calgary.	Border Field.
Regent Oil Co., Ltd.	Calgary.	Turner Valley.
Ribstone Oils, Ltd.	65 Canada Life Bldg., Calgary.	Ribstone Field.
Sasko-Wainwright Oils and Gas Co., Ltd.	713 Canada Bldg., Saskatoon.	Wainwright.
Seneca Oils, Ltd.	23 Canada Life Bldg., Calgary.	Turner Valley.
Sentinel Oils, Ltd.	122-8th Ave. W., Calgary.	Turner Valley.
Wabash Oils, Ltd.	Cor. 10th Ave.-11th St. W., Calgary.	Morley.
Weymarn Oils, Ltd.	Edmonton.	Clearwater.

OTHER NON-METAL MINING INDUSTRIES

Actinolite Mining Industry

Name	Address	Location
ONTARIO— Actinolite Mining Co., Ltd.....	111 Beaver Hall Hill, Montreal, P.Q.	Elzevir, Tp.

Asbestos Mining Industry

		Mine	Township
QUEBEC— Asbestos Corporation, Ltd.....	Canada Cement Co. Bldg., Montreal	Asbestos. Beaver. Boston. British Canadian. Consolidated. King. Maple Leaf. Vimy Ridge. Bell. Greenshield. Jeffrey. Johnson's. Johnson's. Quebec.	E. Broughton. Colerain. Broughton. Coleraine. Thetford. Thetford. Coleraine. Ireland. Thetford. Coleraine. Shipton. Thetford. Coleraine. Thetford. E. Broughton.
Bell Asbestos Mines Inc.....	Ambler, Pa., U.S.A.....		
Canada Asbestos and Chrome Co.....	Black Lake.....		
Canadian Johns-Manville Co., Ltd.....	450 St. James St., Montreal.....		
Johnson's Company.....	Thetford Mines.....		
Northern Asbestos Co., Ltd.....	Thetford Mines.....		
Quebec Asbestos Corporation, Ltd.....	East Broughton.....		

Barytes

NOVA SCOTIA— Brandram-Henderson, Ltd.....	Box 190, Montreal, P.Q.....	East Lake Ainslie, Inverness Co.
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Bituminous Sands

ALBERTA— International Bitumen Co..... McMurray Asphaltum and Oil, Ltd.....	Edmonton..... Petrolia, Ont.....	Fort McMurray district. Fort McMurray district.
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Diatomite

NOVA SCOTIA— Oxford Tripoli Sales, Inc.....	People's Bank Bldg., Harvestrw, N.Y., U.S.A.....	East New Annan.
BRITISH COLUMBIA— B.C. Refractories, Ltd..... Canadian Diatomite, Ltd.....	Ft. Smythe St., Vancouver..... 207 Campbell Bldg., 1062 Douglas St., Victoria.....	Cariboo.

Feldspar Mining Industry

MINES— QUEBEC— Bigelow, G..... Bon Ami, Ltd..... Couture, E..... Donaldson, R. J..... Laurentian Feldspar Co., Ltd..... New York Feldspar Corporation..... O'Brien and Fowler, Ltd..... Parcher, A..... Pedneaud, G..... Whitfield, T..... Whittemore, Mrs A. R..... Winning and Elliott.....	Glen Almond..... Drawer 166, Hochelaga, Montreal... Glen Almond..... Glen Almond..... 204 Notre Dame St. W., Montreal... Lewistown, Penn., U.S.A..... Buckingham..... Glen Almond..... Buckingham..... Buckingham..... 475 Kent St., Ottawa..... Poupore.....	Portland E. Tp. Aylwin Tp. Buckingham Tp. Buckingham Tp. Portland Tp. Buckingham Tp. Derry Tp. Derry Tp. Buckingham Tp. Buckingham Tp. Derry Tp. Buckingham Tp.
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DOMINION BUREAU OF STATISTICS

Feldspar Mining Industry—Concluded

Name	Address	Location
ONTARIO—		
Bathurst Feldspar Mines, Ltd.....	230-232 King St. E., Toronto.....	Bathurst Tp.
Bio-Mica Co., Ltd.....	324 Northcliffe, Montreal, P.Q.....	
Craig, T. H.....	398 Victoria St., Kingston.....	Bathurst Tp.
Genesee Feldspar Co., Inc.....	Rochester, N.Y., U.S.A.....	Monteagle Tp., Bedford, Tp.
Verona Quarries, Ltd.....	21 Main St. E., Hamilton.....	Loughborough Tp.
Wanup Feldspar Mines, Ltd.....	Box 213, Lucknow.....	Dill Tp.
MILL—		
ONTARIO—		
Frontenac Floor and Wall Tile Co., Ltd.....	Box 178, Kingston.....	Kingston.

Garnets

QUEBEC—		
Labelle Nickel and Garnet Co., Ltd.....	354 St. Catherine St. E., Montreal...	Joly Tp.
Langlade Garnet Syndicate.....	132 rue St. Pierre, Quebec.....	Baudin Tp.

Graphite Mining Industry

QUEBEC—		
Canadian Graphite Corporation.....	1193 Phillips Place, Montreal.....	Boyer Tp.
ONTARIO—		
Black Donald Graphite Co., Ltd.....	Calabogie.....	Brougham Tp.

Grindstone Industry

NEW BRUNSWICK—		
Miramichi Quarry Co., Ltd.....	Quarryville.....	Quarryville.
Read Stone Co., Ltd.....	Sackville.....	Stonehaven.
BRITISH COLUMBIA—		
McDonald, J. A. and C. H., Ltd.....	Vancouver.....	Newcastle Island.

Gypsum Mining Industry

NOVA SCOTIA—		
Atlantic Gypsum Products Co.....	40 Central St., Boston, Mass., U.S.A.	Walton, Hants Co., and Cheticamp, Inverness Co.
Canadian Gypsum Co.....	Windsor.....	Wentworth, Hants Co.
Connecticut Adament Plater Co.....	New Haven, Conn., U.S.A.....	Cheverie, Hants Co.
Ingonish Gypsum Co., Ltd.....	Canada Cement Co., Bldg., Montreal, Que.	Ingonish Beach, Victoria Co.
Iona Gypsum Products, Ltd.....	Sydney.....	Iona, Victoria Co.
Newark Platter Co.....	30 Church St., New York, N.Y., U.S.A.	
North American Gypsum Co.....	Baddeck.....	Ottawa Brook, Victoria Co.
Nova Scotia Coal and Gypsum Co., Ltd.....	Box 13, Mabou.....	Baddeck Bay, Victoria Co.
Windsor Gypsum Co.....	Box 727 Newburgh, N.Y., U.S.A.	Mabou, Inverness Co.
Windsor Plaster Co., Ltd.....	Windsor.....	Newport, Hants Co.
NEW BRUNSWICK—		
Albert Manufacturing Co.....	Hillsborough.....	Hillsborough, Albert Co.
Fraser, Donald.....	Plaster Rock.....	Plaster Rock.
ONTARIO—		
Canada Gypsum and Alabastine, Ltd.....	Paris.....	Caledonia, Seneca Tp.
		Lythmore, Oneida Tp.
MANITOBA—		
Canada Gypsum and Alabastine, Ltd.....	Box 3057, Winnipeg.....	Gypsumville.
BRITISH COLUMBIA—		
Canada Cement Co., Ltd.....	Canada Cement Co., Bldg., Montreal, P.Q.	Maycook.
Canada Gypsum and Alabastine, Ltd.....	509 Richards St., Vancouver.....	Falkland.

Iron Oxide Mining Industry

Name	Address	Location
QUEBEC—		
Argall, Thos. H.	Pointe du Lac.	Pointe du Lac.
Canada Paint Co., Ltd.	572 William St., Montreal.	Red Mill, Champlain Co.
Montmorency Paint Products Co., Ltd.	1100 Craig St. W., Montreal.	Pelletier Tp.
BRITISH COLUMBIA—		
Davidson, J. G. and Thompson, J. H.	University of B.C., Vancouver.	(near) Mons.
McDonald, R. W.	Box 157, Banff, Alta.	Windermere Dist.

Magnesite Mining Industry

QUEBEC—		
International Magnesite Co., Ltd.	Calumet.	Harrington Tp.
Scottish Canadian Magnesite Co., Ltd.	Kilmar.	Grenville Tp.
North American Magnesite Producer, Ltd.		

Manganese Bog

NEW BRUNSWICK—		<i>Township</i>
New Brunswick Mineral Development Co.	Hillsboro.	Dawson Settlement.

Mica Mining Industry

QUEBEC—		
Blackburn Bros., Ltd.	Blackburn Bldg., Ottawa, Ont.	Templeton.
Cross, W. C.	Cascades.	Hull.
Flynn, H. J.	33 Montcalm St., Hull.	Cameron.
Martin, A. G.	236 Besserer St., Ottawa, Ont.	Hull.
McGlashan, R. J.	190 Montcalm St., Hull.	Wakefield.
Mineral Products Co., Ltd.	350 Bay St. Toronto 2, Ont.	Hull.
Nault, J. B.	Maniwaki.	Cameron.
ONTARIO—		
Bennett, H. V.	Perth.	South Elmsley.
Bio-Mica Co., Ltd, The.	324 Northcliffe Ave., Montreal, Que.	Portland.
Cross, W. C.	Cascades.	Loughborough.
Kent Bros. and Estate J. M. Stoness.	Kingston.	Bedford.
Lee, W. W.	Bedford Mills.	
Loughborough Mining Co., Ltd.	Sydenham.	Loughborough.
McLaren, W. L.	Perth.	North Burgess.
Martin, A. G.	236 Besserer St., Ottawa.	South Burgess.
Smith, Damon.	R.R. 3, Brockville.	

Mineral Waters Industry

QUEBEC—		
Abenakis Springs Co.	Abenakis Springs.	Abenakis Springs.
Eau Minerale Etoile et Co., Ltd.	Ste Genevieve de Batiscan.	Ste. Genevieve de Batiscan.
Roy, Cyprien.	St. Germain.	L'Islet Plate.
ONTARIO—		
Canada Dry Ginger Ale, Ltd.	6380 St. Urbain St., Montreal, P.Q.	Caledonia Springs.
Carlsbad, Ltd.	Carlsbad Springs.	Bourget.
Deneault, F.	Bourget.	Gloucester Tp.
Goderich Mineral Water Co.	Goderich.	Bourget.
Gurd, Charles and Co., Ltd.	1016 Bleury St., Montreal, P.Q.	Goderich.
Sanitaris, Ltd.	Box 358, Arnprior.	Caledonia.
		Fakenham Tp.

Phosphate Mining Industry

QUEBEC—		
Cole, Willard.....	Buckingham.....	Wakefield Tp.
McGlashan, R. J.....	190 Montcalm St., Hull.....	
Millar, James.....	Glen Almond.....	
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Co. of Canada, Ltd.....	Trail.....	Crow's Nest, Fort Steele Mining Division.

DOMINION BUREAU OF STATISTICS

Pyrites Mining Industry

Name	Address	Location
QUEBEC— Consolidated Copper and Sulphur Co.....	Eustis.....	Ascot Tp.
ONTARIO— Grasselli Chemical Co., Ltd.....	Hamilton.....	Blythfield Tp.
BRITISH COLUMBIA— Britannia Mining and Smelting Co., Ltd.....	Britannia Beach.....	Britannia Mine, Vancouver Mining Division.

Quartz Mining Industry

NOVA SCOTIA— Dominion Iron and Steel Co., Ltd..... River Dennis Sand and Clay Co., Ltd.....	Sydney..... Port Hood.....	Leitchs Creek. Melford, Inverness Co.
QUEBEC— Cameron, Wm. and J. J..... Canada Glass Products, Ltd..... Donaldson, Robert J..... O'Brien and Fowler..... Parcher, Alfred..... Pedneaud, G..... Silico, Ltd.....	Box 11, Buckingham..... 193 Main St., Hull..... Glen Almond..... Ottawa Electric Bldg., Ottawa..... Glen Almond..... Buckingham..... 423 rue Mayor, Montreal.....	Buckingham Tp. East Templeton. Buckingham Tp. Derry Tp. Derry Tp. Buckingham Tp. Parish of St. Canut.
ONTARIO— Dominion Mines and Quarries, Ltd..... Mond Nickel Co., Ltd..... Raynor, Geo..... Wright & Co.....	Canada Life Bldg., 46 King St. W., Toronto..... Coniston..... 159 Bay St., Toronto..... 960 Queen St., Sault Ste. Marie.....	District of Algoma (Killarney Quarry). Neelon Tp. Kaladar. Deroche Tp.
MANITOBA—(Rose quartz) Miller, Kenneth, E.....	133-D Sherbrooke St., Winnipeg.....	Pointe du Bois.
BRITISH COLUMBIA— Consolidated Mining and Smelting Co. of Canada, Ltd..... Granby Consolidated Mining, Smelting and Power Co., Ltd.....	Trail..... Anyox.....	Oliver. Golskeish, Nass River Mining Division. (Outsider) Portland Canal Mining Division.

Salt Industry

NOVA SCOTIA— Malagash Salt Co., Ltd.....	204 Provost St., New Glasgow.....	Malagash, Cumberland Co.
ONTARIO— Brunner-Mond, Canada, Ltd..... Canadian Salt Co., Ltd..... Dominion Salt Co., Ltd..... Exeter Salt Works Co., Ltd..... Goderich Salt Co., Ltd..... Kincardine Salt Co., Ltd..... Western Canada Flour Mills Co., Ltd..... Western Salt Co., Ltd.....	Amherstburg..... Sandwich..... Front St., Sarnia..... Exeter..... Goderich..... Kincardine..... 287 Macpherson Ave., Toronto 9..... 411 Dominion Bank Bldg., Toronto.	Amherstburg, Essex Co. Windsor and Sandwich, Essex Co. Sarnia, Lambton Co. Exeter, Huron Co. Goderich, Huron Co. Kincardine. Goderich, Huron Co. Courtright, Lambton Co.

Silica Brick Industry

NOVA SCOTIA— Dominion Iron and Steel Co., Ltd.....	Sydney.....	Sydney.
ONTARIO— Algoma Steel Corporation, Ltd.....	Sault Ste. Marie.....	Sault Ste. Marie.

Sodium Carbonate Mining Industry

BRITISH COLUMBIA— Lloyd-Campbell, Ltd..... Dominion Soda Products, Ltd.....	728 Rogers Bldg., Vancouver..... Vancouver.....	Lloyd Spur. Clinton Div.
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Sodium Sulphate Mining Industry

Name	Address	Location
SASKATCHEWAN—		
Bishopric and Lent Co.....	Gerke Bldg., Cincinnati Ohio, U.S.A	Expanse.
Sodium Sulphate Refining Co., Ltd.....	437 Lougheed Bldg., Calgary.....	(near) Fusilier, Sask.
White Shore Salts and Chemical Co., Ltd.....	1371 George St., North Battleford..	White Shore Lake.

Talc and Soapstone Industry

QUEBEC—		
Robertsonville Soapstone and Quarry Co.....	Robertsonville.....	Broughton Tp.
ONTARIO—		
Asbestos Pulp Co., Ltd.....	Madoc.....	Huntingdon Tp.
Gillespie Co., Ltd., Geo. H. (Mill).....	Madoc.....	Madoc (Plant at).
Henderson Mines, Ltd.....	Madoc.....	Huntingdon Tp.
BRITISH COLUMBIA—		
National Talc, Ltd.....	312 McKinnon Bldg., Melinda St., Toronto.....	Red Mt. Mineral Claim.

Volcanic Dust Industry

SASKATCHEWAN—		
Old Sol Manufacturing Co., Ltd.....	805 Erin St., Winnipeg.....	Waldeck.
Van-Kel Cleansers, Ltd.....	Swift Current.....	Waldeck and Beverly.

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

CLAY PRODUCTS INDUSTRY

Brick and Tile

Name	Address	Location
NOVA SCOTIA—		
Brooks, Geo.....	New Glasgow.....	Plymouth.
Brooks, Stephen and Sons.....	Box 359, New Glasgow.....	New Glasgow.
Miller, Jas. B.....	Elmsdale.....	Barney's Brook.
Nova Scotia Clay Works, Ltd.....	Havelock St., Amherst.....	Elmsdale, Pugwash.
Shaw, L. E., Ltd.....	Avonport.....	Avonport.
NEW BRUNSWICK—		
Ryan, M., and Sons, Ltd.....	Woodstock Road, Fredericton.....	Woodstock Road, Fredericton.
QUEBEC—		
Ascot Tile and Brick Co., Ltd.....	Ascot Corner.....	Ascot Corner.
Bell, W. and D.....	1286 St. Valier St., Quebec.....	Little River Road.
Chicoutimi Brick Co., Ltd.....	Chicoutimi.....	St. Paul Road, Chicoutimi.
Citadel Brick, Ltd.....	14 St. Joseph St., Quebec.....	Boischatel, L'Islet Station.
Eastern Townships Brick and Tile Co., Ltd.....	East Angus.....	East Angus.
Lennoxville Brick and Tile Co.....	Lennoxville.....	Ascot Range.
L'Industrielle de St. Tite, Ltd.....	St. Tite.....	St. Tite.
L'Islet Brick Co.....	64 de la Gare, Montmagny.....	L'Islet Station.
Longpré, Emile.....	St. Félix de Valois.....	St. Félix de Valois.
National Brick Co. of Laprairie, Ltd.....	Canada Cement Co. Bldg., Montreal	Delson, Laprairie.
Oliver, Frank.....	Box 310, Ormstown.....	Ormstown.
Proulx Bros.....	Box 384, Richmond.....	Richmond.
St. Lawrence Brick Co., Ltd.....	29 St. James St. W., Montreal.....	Laprairie.
Scott Brick Co.....	8 St. Joseph St., Quebec.....	Scott Junction.

Brick and Tile—Continued

Name	Address	Location
ONTARIO—		
Alvinston Brick and Tile Co., Ltd.	Alvinston	Alvinston.
Batchelor, Samuel	Proton Station	Proton Station.
Booth Brick and Lumber Co., The	Box 61, New Toronto	Etobicoke Tp.
Brampton Pressed Brick Co., Ltd.	Brampton	Brampton.
Broadwell, B. and Son	Box 137, Kingsville	(Near) Kingsville.
Butwell, R.	107 Lake Shore Road, Humber Bay	Etobicoke.
Caledon Shale-Brick, Ltd.	1167 Bay St., Toronto	Caledon Tp.
Campbell, Neil F. and Sons	R.R. No. 1, West Lorne	West Lorne.
Canadian Fireclay Products, Ltd.	60½ Adelaide St. E. Toronto	New Toronto.
Canadian Pressed Brick Co., Ltd.	195 Ottawa St. S., Hamilton	Hamilton.
Chapman Brick Co., Ltd.	104½ Dawes Road, Toronto	East York, Tp.
Cooksville Co., Ltd.	132 St. James St. W., Montreal, P.Q.	Cooksville.
Cooper, W. H.	312 Clyde Block, Hamilton	Hamilton.
Curtin, Frank	R.R. No. 4, Lindsay	Lindsay.
Curtis Bros.	Box 809 Peterboro.	Peterboro.
De Laplante, J. E.	Dawes Road, Coleman P.O., Toronto	Toronto.
Deller, Albert and Son	Brownsville	Brownsville.
Deller Bros.	Norwich	North Norwich.
Dolan, John	R.R. 2, Watford	Warwick.
Dockhart Brick and Tile Co.	Arnprior	Arnprior.
Dominion Sewer Pipe and Clay Industries, Ltd.	Swansea	Aldershot.
Donaldson, S. E.	R.R. 4, Harriston	Fulton Mills.
Denison Tile Co.	24 Wyandotte St. E., Windsor	Rochester Tp.
Don Valley Brick Works, Ltd.	114 Federal Bldg, Toronto	York Tp.
Douglas and Douglas	Wilkesport	Wilkesport.
Dublin Brick and Tile Yard	Dublin	Dublin S.
Dunn, D.	Box 74, New Liskeard	New Liskeard.
Elliott, Charles	Bluevale	Bluevale.
Elliott, Wm.	Glenannan	Glenannan.
Elliott, James, Jr.	519 Wellington St. W., Sault Ste Marie	E. Korah, Tp.
Fort William Brick Co.	509 Victoria Ave., Fort William	West Fort William.
Frid Bros.	Dundas Road and Macklin St., Hamilton	Hamilton.
Gardiner, Wm.	Box 83, Blenheim	Blenheim.
Godfrey, Thos. and Co.	Carleton Place	Carleton Place.
Grimsby Brick and Tile, Ltd.	Box 415, Grimsby	Grimsby.
Hallatt, Herbert and Son	Comber	Comber.
Hallatt, Wm.	Richards Bldg., Chatham	Merlin.
Halton Brick Co., Ltd.	28 Symes Road, Toronto 9	Equesting Tp.
Hamilton Pressed Brick Co., Ltd.	Kensington Ave. S., Hamilton	Hamilton.
Hill, Aaron	Essex	Essex.
Hill, A. W.	R.R. 1, Coatsworth	E. Tilbury, Tp.
Hirocock Bros.	Box 83, Bowmanville	Bowmanville.
Hitch, Thos.	1st Ave., St. Thomas	St. Thomas.
Hodder, Mrs. J. H. and Sons	Dutton	Dutton.
Houston Co. Ltd., The	Belleville	Belleville.
Howlett, Fred. and Sons, Ltd.	Box 3, Petrolia	Petrolia.
Huntsville Brick Works	Box 308, Huntsville	Huntsville.
Interprovincial Brick Co., Ltd.	26 Queen St. E., Toronto	Cheltenham, Milton.
Jackson, W. B.	290 Rawdon St., Brantford	Brantford.
Janes, D. A.	Mt. Brydges	Mt. Brydges.
Jamieson Lime Co.	Renfrew	Renfrew.
Jasperson, B., Brick and Tile Yards	Box 586, Kingsville	Coatsworth.
Jervis, W. J.	R.R. 3, Dorchester	Dorchester.
Koebel Bros.	Box 54, Clements	St. Clements.
Kruze Bros.	Seaforth	Tuckersmith Tp.
Lindsay, Earl	R.R. 2, Wallaceburg	Wallaceburg.
Martin, Thos E.	Thamesville	Thamesville.
McComb, Chester	R.R. 2, London	London.
McCormick Bros.	R.R. 5, Watford	Kingscourt Junction.
McEachran, Norman	Highgate	Highgate.
McMahon, Robert	R.R. 2, Kerwood	Strathroy.
Middleton, C.	Wyoming	Wyoming.
Milton Brick, Ltd.	1158 Bay St., Toronto	Milton.
Miner, Manly F.	Kingsville	(Streetsville).
Missouri Brick Yard (W. H. Deller)	R.R. 4, Thorndale	Kingsville.
Napanee Brick and Tile Works	R.R. 3, Napanee	Thorndale.
Ollman Bros.	111 Macklin St., Hamilton	Napanee.
Ottawa Brick and Terra Cotta Co., Ltd.	Billings Bridge	Hamilton.
O'Reilly, T. E.	320 Bay St., Ottawa	Billings Bridge.
Ott Brick and Tile Mfg. Co., Ltd., The	33 King St. E., Kitchener	Hog's Back.
Owen Sound Brick Co., Ltd., The	928, 2nd Ave. E., Owen Sound	(Kitchener.
Parks, Henry W.	R.R. 2, Dresden	Waterloo.
Paxton, Fred R.	10 Herrick Ave., St. Catharines	Owen Sound.
Pembroke Brick Co., The	Pembroke	Dresden.
Phinn Brick Co.	St. James Park P.O., London	St. Catharines.
Phippen and Field	159 Dawes Road, Toronto	Pembroke.
Piggott, Geo. and Co.	72 Guestville Ave., Toronto 9	London.
Port Rowan Brick and Tile Co.	Port Rowan	Toronto.
Price and Cumming	Salisbury Ave., Humber Bay	Toronto.
Price and Smith	458 Greenwood Ave., Toronto	Port Rowan.
		Humber Bay.
		Toronto.

Brick and Tile—Concluded

Name	Address	Location
ONTARIO—Concluded		
Ontario Brick and Tile Plant.....	Parliament Bldg., Toronto.....	Mimico.
Red Star Brick and Tile Yard.....	157 Park St., Stratford.....	Stratford.
Ridgetown Brick and Tile Co.....	Erie St. N. Ridgetown.....	Ridgetown.
Richardson, Jas. and Son.....	Kerwood.....	Kerwood.
Russel Brick Co.....	40 Blake St., Toronto.....	Toronto.
Snelgrove, A.....	Beaverton.....	Beaverton.
Sproat, Wm. M.....	R. R. 4, Seaford.....	Tuckersmith Tp.
Standard Brick Co., Ltd., The.....	500 Greenwood Ave., Toronto.....	Toronto.
Steele, Edwin.....	Vankleek Hill.....	Vankleek Hill.
Streetsville Brick Co., Ltd., The.....	410 Crown Office Bldg., Toronto 2.....	Streetsville.
Stroh, M. C.....	Conestogo.....	Conestogo.
Sun Brick Co., Ltd.....	1104 Bay St., Toronto.....	Todmorden.
Superior Brick and Tile Co., Ltd.....	426 Victoria Ave., Fort William.....	Tuckersmith Tp.
Sutherland, W. A.....	Box 293, Parkhill.....	Parkhill.
Tope, Richard, Estate.....	945 King St. W., Hamilton.....	Hamilton.
Toronto Brick Co., Ltd.....	897 Bay St., Toronto.....	/Milton.
Wagstaff, Chas.....	R. R. 4, Lindsay.....	Toronto.
Wagstaff, A. H.....	348 Greenwood Ave., Toronto.....	Lindsay.
Waite, John E.....	Forrester's Falls.....	Toronto.
Wallace R. and Sons.....	34 Main St., North Bay.....	Forrester's Falls.
Wein, Aaron.....	Crediton.....	North Bay.
Winch, Stuart A.....	Paisley.....	Crediton.
Windsor Brick and Tile Co.....	203 Exchange Bldg., Windsor.....	Paisley.
Wright, Geo. and Sons.....	Box 56, Comber.....	(near) Kingsville.
		Comber.
MANITOBA—		
Alsip Brick Tile and Lumber Co., Ltd.....	200 Tribune Bldg., Winnipeg.....	Winnipeg.
Gilbert Plains Brick Co.....	Gilbert Plains.....	Gilbert Plains.
Marion, J. A.....	Box 30, St. Boniface.....	St. Boniface.
National Clay Products, Ltd.....	915 Somerset Block, Winnipeg.....	Edrans.
Snyder, A. & Co., Ltd.....	Portage la Prairie.....	Portage la Prairie.
SASKATCHEWAN—		
Bruno Clay Works, Ltd.....	Bruno.....	(near) Bruno.
Dominion Firebrick and clay Products, Ltd. The.....	507 Scott Block, Moose Jaw.....	Claybank.
International Clay Products, Ltd.....	Estevan.....	Estevan.
Saskatoon Clay Products.....	1320 3rd Ave. North, Saskatoon.....	Saskatoon.
Shand Coal and Brick Co.....	Shand.....	Shand.
ALBERTA—		
Acme Brick Co., Ltd., The.....	125 Alberta Block, Edmonton.....	Cannel Siding.
Benson, Ole.....	Grande Prairie.....	Grande Prairie.
Collins, P.....	134-12 Ave W., Calgary.....	Cochrane.
Crandell, E. H., Pressed Brick and Sand stone Co.....	607 MacLean Block, Calgary.....	Brickburn.
Little, J. B. and Sons.....	9120 100th Ave., Edmonton.....	Riverdale.
Medicine Hat Brick and Tile Co., Ltd.....	Medicine Hat.....	Medicine Hat.
Redcliff Brick and Coal Co., Ltd.....	Box 5, Redcliff.....	Redcliff.
Redcliff Premier Brick Co., Ltd.....	Box C 2, Redcliff.....	Redcliff.
Redcliff Pressed Brick Co., Ltd.....	Redcliff.....	Redcliff.
BRITISH COLUMBIA—		
Baker Brick and Tile Co., Ltd.....	Corner Douglas St. and Tolmie Ave., Victoria.....	Victoria.
Anderson, Axel and Nordin, Carl.....	Smithers.....	Smithers.
Christian Community of Universal Brotherhood, Ltd.....	Verigin, Sask.....	Grand Forks.
Clayburn Co., Ltd.....	320 Credit Foncier Bldg., Vancouver.....	/Clayburn.
		Kilgard.
Gabriola Shale Products, Ltd.....	102 Moody Block, Victoria.....	Gabriola Island.
Haug, Wm. and Son.....	Kelowna.....	Kelowna.
Port Haney Brick Co., Ltd., The.....	846 Howe St., Vancouver.....	Port Haney.
Vancouver Brick and Tile Co., Ltd.....	2065-10th Ave. W., Vancouver.....	Vancouver.
Victoria Brick Co., Ltd., The.....	3001 Douglas St., Victoria.....	Victoria.

Clay Sewer Pipe

Name	Address	Location
NOVA SCOTIA— Standard Clay Products, Ltd.....	New Glasgow.....	New Glasgow.
QUEBEC— Standard Clay Products, Ltd.....	St. Johns.....	St. Johns.
ONTARIO— Dominion Sewer Pipe and Clay Industries, Ltd..... Hamilton and Toronto Sewer Pipe Co., Ltd..... Ontario Sewer Pipe and Clay Products, Ltd.....	Swansea..... Wentworth St. N., Hamilton..... Mimico.....	Swansea. Hamilton. Mimico.
ALBERTA— Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
BRITISH COLUMBIA— Clayburn Co., Ltd.....	302 Credit Foncier Bldg., Vancouver	Kilgard.

Firebrick, Fireclay and Fireclay Products

NOVA SCOTIA— Dominion Iron and Steel Co., Ltd.....	Sydney.....	Sydney, Shubencadie.
NEW BRUNSWICK— Foley Pottery, Ltd.....	Saint John.....	Saint John.
QUEBEC— *Canada Firebrick Co., Ltd..... Montreal Terra Cotta Co., Ltd..... Standard Clay Products, Ltd.....	371 Aqueduct S., Montreal..... Drummond Bldg., St. Catharine St., Montreal..... Box 819 St. John's.....	Montreal. Lakeside. St. John's.
ONTARIO— *Bailey, Geo. and Co..... National Fire Proofing Co. of Canada, Ltd.....	331 Bay St., Toronto..... 601 Dominion Bank Bldg., Toronto.	Toronto. Toronto.
SASKATCHEWAN— Dominion Firebrick and Clay Products, Ltd....	421 Hammond Bldg., Moose Jaw....	Claybank.
ALBERTA— Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
BRITISH COLUMBIA— B.C. Refractories, Ltd..... Clayburn Co., Ltd.....	365 Water St., Vancouver..... 302 Credit Foncier Bldg., Vancouver	Vancouver. Clayburn.

Kaolin

QUEBEC— Bryce, Robt. A.....	350 Bay St., Toronto, Ont.....	Huberdean.
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Stoneware and Pottery

NEW BRUNSWICK— Foley Pottery, Ltd.....	Saint John.....	Saint John.
QUEBEC— *Canadian Potteries, Ltd..... *Canada Stoneware Works..... *Dominion Sanitary Pottery Co., Ltd.....	2 Longueuil St., St John's..... Iberville..... 189 St. James St., St. John's.....	St. John's. Iberville. St. John's.
ONTARIO— *Campbell's, R., and Sons..... *Canadian General Electric Co..... *Canadian Porcelain Co., Ltd..... Davis, John and Sons..... *Dominion Insulator and Manufacturing Co., Ltd. Foster Pottery Co., The..... *Frontenac Floor and Wall Tile Co., Ltd..... *Smith Potteries..... *Smith and Stone.....	100 Locke St. S., Hamilton..... 212 King St. W., Toronto..... Paradise Road, Hamilton..... 60 Heath St. W., Toronto..... Niagara Falls..... Main St. W., Hamilton..... Box 178, Kingston..... King St. W. and Alexander Blvd., Oshawa..... Georgetown.....	Hamilton. Peterborough. Hamilton. Toronto. Niagara Falls. Hamilton. Kingston. Oshawa. Georgetown.
ALBERTA— Medalta Potteries, Ltd.....	Medicine Hat.....	Medicine Hat.

Other Structural Materials.

Cement Industry

Name	Address	Location
QUEBEC—		
Canada Cement Co., Ltd.....	Canada Cement Co. Bldg., Montreal	Hull. Montreal East. Montreal East.
National Cement Co.....	60 rue St. Jacques West, Montreal...	Montreal East.
ONTARIO—		
Canada Cement Co., Ltd.....	Canada Cement Co., Bldg., Montreal	Belleville. Lakefield. Port Colborne. St. Mary's.
St. Mary's Cement Co., Ltd.....	357 Bay St., Toronto.....	
MANITOBA—		
Canada Cement Co., Ltd.....	Canada Cement Co., Bldg., Montreal, Que.	Fort Whyte. Babcock.
Commercial Cement Co., Ltd.....	1002 McArthur Bldg., Winnipeg.....	
ALBERTA—		
Canada Cement Co., Ltd.....	Canada Cement Co., Bldg., Montreal, Que.....	Exshaw. Marlboro.
Marlboro Cement Co.....	Edmonton.....	
BRITISH COLUMBIA—		
British Columbia Cement Co., Ltd.....	305 Belmont Bldg., Victoria.....	Bamberton.

Lime Industry

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.....	Sydney.....	Sydney. Point Edward. Windsor.
Eastern Lime Co., Ltd.....	Windsor.....	
NEW BRUNSWICK—		
Bathurst Power and Paper Co., Ltd.....	Bathurst.....	Bathurst.
Peters, C. H. and Sons, Ltd.....	Saint John.....	Torriburn.
Purdy and Green.....	323 Main St., Saint John.....	Saint John.
Snowflake Lime Ltd.....	3 Pokiok Road, St. John.....	St. John.
QUEBEC—		
Arnaud and Beaudry.....	Joliette.....	Joliette.
Baron, A.....	St. Dominique de Bagot.....	St. Dominique.
Boivin, Arthur.....	Pont Rouge.....	Pont Rouge.
Canada Lime, Ltd.....	St. Marc des Carrières.....	St. Marc des Carrières.
Dominion Lime Co., The.....	East Angus.....	Lime Ridge.
Heon, Octave.....	St. Louis de France.....	St. Louis de France.
Lalumière, Joseph.....	St. Dominique de Bagot.....	St. Dominique.
Laurentian Stone Co., Ltd.....	250 Catherine St., Ottawa, Ont.....	Hull.
Limoges, Fils et Cie.....	552 rue Pouport, Montreal.....	Montreal.
Standard Lime Co.....	Joliette.....	St. Marc des Carrières. St. Paul de Joliette.
Stinson-Reeb Builders' Supply Co., Ltd.....	360 Dorchester St. W., Montreal...	Montreal.
La Cie de chaux Nationale Ltée.....	St Marc des Carrières.....	St Marc des Carrières
ONTARIO—		
Canada Gypsum & Alabastine, Ltd.....	Paris.....	Elora and Teeswater
American Cynamid Co.....	535-5th Ave., New York City, N.Y.	Niagara Falls.
Beachville White Lime Co., The.....	Beachville.....	Beachville.
Biederman, Albert G.....	R.R. 1, Golden Lake.....	Golden Lake.
Brunner-Mond (Canada), Ltd.....	Canadian Bank of Commerce Bldg., Toronto.....	Anderdon Tp. Carleton Place.
Cameron, W. M.....	Box 65, Carleton Place.....	Cobocconk and Sand Point.
Canada Lime Co., Ltd.....	Cobocconk.....	Owen Sound.
Chalmers, M. and Campbell, W.....	689 Seventh St. W., Owen Sound.....	Hespeler. Kelso. Puslinch.
Christie, Henderson and Co., Ltd.....	201 Crown Office Bldg., Toronto 2.....	
Dominion Rock Products Co., Ltd.....	1019 New Birks Bldg., Montreal, Que.....	Eganville. Chatham. Hamilton.
Dominion Sugar Co., Ltd.....	Chatham.....	Hamilton.
Gallagher Lime and Stone Co., Ltd.....	James St., Hamilton.....	Renfrew.
Jamieson Lime Co.....	Renfrew.....	Napanee.
Kinkley, Harry.....	Napanee.....	Milton.
Robertson, D. and Co., Ltd.....	26 Queen St. E., Toronto 2.....	Eganville.
Shane Lime Co., The.....	Eganville.....	Beachville. Guelph.
Standard White Lime Co., Ltd.....	15 Douglas St., Guelph.....	Cobocconk. Limehouse.
Toronto Brick Co., Ltd.....	897 Bay St., Toronto.....	Glenelg Tp
Toronto Lime Co., Ltd., The.....	26 Queen St. E., Toronto 2.....	
Weppler, Henry.....	R.R. 2, Pricerville.....	

Lime Industry—Concluded

Name	Address	Location
MANITOBA—		
Canada Gypsum and Alabastine Ltd.....	504 Trust and Loan Bldg., Winnipeg.	Winnipeg.
Gillis Quarries, Ltd.....	Spruce and Richard Sts., Winnipeg..	Garson.
Moosehorn Lime Co., Ltd., The.....	214 Avenue Bldg., Winnipeg.....	Moosehorn.
Winnipeg Supply and Fuel Co., Ltd.....	214 Avenue Bldg., Winnipeg.....	Stonewall.
ALBERTA—		
Loder's Lime Co., Ltd.....	Kananaskis.....	Kananaskis.
Summit Lime Works.....	Box 273, Lethbridge.....	(near) Crow's Nest.
BRITISH COLUMBIA—		
Hedley Gold Mining Co., Ltd.....	Hedley.....	Hedley.
McNeil Lime Co., Ltd.....	744 Hastings St. W., Vancouver.....	Blubber Bay, Texada Island.
Rosebank Lime Co.....	744 Hastings St. W., Vancouver.....	Esquimalt.
Pacific Mills.....	Standard Bank Bldg., Vancouver.....	Cunningham Island.

Sand and Gravel

NOVA SCOTIA—		
Avon River Power Co., Ltd., The.....	Water St., Windsor.....	Chester Road, Windsor.
Campbell, J. J. and Son.....	Boisdale.....	Boisdale, and Barra Glen.
McNeil Bros.....	Pond St., Sydney Mines.....	Beaver Cove.
Mosher, Walter.....	307 Portland St., Dartmouth.....	Hants Co.
Norrie, Henry J.....	R.R. 6, Truro.....	North River.
N. S. Highways.....	.....	Debert Plant.
Routledge, W. F.....	Reserve Mines, Cape Breton.....	Lingan, Cape Breton.
NEW BRUNSWICK—		
Anderson, A. W.....	Fairville.....	St. John Co.
Canadian Independent Oil, Ltd.....	East Saint John.....	Saint John.
Likely, Jos. A.....	Saint John.....	East Saint John.
Saint John Municipal.....	Saint John.....	Courtney Bay.
QUEBEC—		
Alcoa Power Co., Ltd.....	Box 620 Kenogami.....	Jonquière Tp.
Aluminum Co. of Canada, Ltd.....	Canada Life Bldg., Toronto, Ont.....	Jonquière Tp.
Asbestos Corporation, Ltd.....	Thetford Mines.....	Thetford Tp.
Bedard, Art.....	Pont Rouge.....	Pont Rouge.
Bélanger, Jos.....	Ascot.....	Ascot.
Bélisle, M. Euclid.....	Rue St. Paul, Coaticook.....	Coaticook.
Benoit, J. A.....	Mont St. Grégoire.....	Mont St. Grégoire.
Bergeron, Ursin.....	Jonquière.....	Jonquière.
Bernier, Mrs. Joseph.....	Belœil Village.....	Belœil Village.
Blais, Jos.....	Ave Mont Marie, Lévis.....	Lévis.
Boivin, Thos.....	7 Lafontaine Ave., Chicoutimi.....	Chicoutimi.
Bonner Sand and Ballast, Ltd.....	110 Bridge St., Montreal.....	Durham Tp.
Bourgeois, Edmond.....	Arthabaska.....	Arthabaska.
Brault, F. X.....	St. Dominique.....	St. Dominique.
Brault, Delphin.....	St. Alexandre.....	St. Alexandre.
Brault, Wm.....	16-1st Ave. S., Sherbrooke.....	Orford, Tp.
Brodeur, Eugène.....	Mont St. Hilaire.....	Mont St. Hilaire.
Brouillet Sand and Gravel Co., Ltd.....	Rawdon.....	Rawdon.
Canadian Gravel Co.....	Shawinigan Falls.....	St. Maurice River.
Canadian Import Co.....	83 Dalhousie St., Quebec.....	St. Lawrence River.
Canadian Johns-Manville Co., Ltd.....	Asbestos.....	Shipton Tp.
Cauchon, Edouard.....	Canada Cement Bldg., Montreal.....	Grand Mère.
Chamberland, Jos.....	140-11th St., Quebec.....	Mont Mills.
Cloutier, J. E.....	St. Pierre de Charlesbourg.....	St. Pierre de Charlesbourg.
Coaticook, Town of.....	100 Cartier St., Chicoutimi.....	Chicoutimi.
Compagnie de Sable, Ltée, La.....	C.P. 150, Coaticook.....	Coaticook.
Consolidated Sand Co., Ltd.....	10-3rd Avenue, Limoilou.....	St. Charles River.
	270 Ottawa St., Montreal.....	(St. Maurice River.
		(Lake of Two Mountains.
Côté, Albert.....	St. Fulgence.....	Rang St. Joseph.
Côté, Elie.....	Hébertville.....	Hébertville.
Dalcourt, Henri.....	R.R. 1 St. Félix de Valois.....	St. Félix de Valois.
Dionne and Dionne.....	Box 143, Coaticook.....	Coaticook.
Dubuc, J. E. A.....	7 Lafontaine Ave., Chicoutimi.....	Laterrière.
Duke Price Power Co., Ltd.....	Arvida.....	Roberval.
Fortin, Phidine.....	St. Armand.....	St. Armand.
Fraser-Brace Engineering Co., Ltd.....	107 Craig St., Montreal.....	Paugan Falls.
Gagné, Mde J. B. A.....	Boischatel.....	Boischatel.
Gagnon, Louis Philippe.....	St. David de Lévis.....	St. Telephore.
Gagnon et Potvin.....	St. Joseph d'Alma.....	St. Joseph d'Alma.
Gauthier, Isidore.....	Rivière du Moulin, Chicoutimi.....	Chicoutimi.
Granger, Ildege.....	Ste. Marie Salomée.....	Ste. Marie Salomée.
Grenier, Apollinaire.....	Beauport.....	Beauport.
Houde, Dr. Fred.....	159 Notre Dame St., Three Rivers.....	Three Rivers.
Independent Sand Co., Ltd.....	12 Amesbury Ave., Montreal.....	3876 Notre Dame St. E., Mont- real.
Leclerc, Adalbert.....	Belœil Village.....	St. Hilaire.
Lepine, Pierre.....	Charlesbourg.....	Charlesbourg.
Letourneau, Arthur.....	St. Rémi.....	St. Rémi.

Sand and Gravel—Continued

Name	Address	Location
QUEBEC—Concluded.		
MacNeil, William.....	West Brome.....	West Brome.
Melançon, J. T. A.....	12 Bord de l'eau, Grand Mère.....	Rang des Hêtres.
McGuire, Annie.....	Buckingham.....	Papineau.
Montreal, City of.....	City Hall, Montreal.....	St. Frederic.
Montreal Harbour Commission.....	Montreal.....	Montreal Harbour.
Oka Sand and Gravel Co., Ltd.....	248 McCord St., Montreal.....	Lake of Two Mountains.
Paradis, G. H.....	Hébertville.....	Hébertville.
Paradis, Pître.....	Hébertville.....	Rang St. Urbain.
Poulin, Luc.....	Mont St. Grégoire.....	Mont St. Grégoire.
Préfontaine, Octave.....	Belœil.....	Rang du Ruisseau.
Quebec Harbour Commission.....	Quebec.....	Wolfe's Cove Terminals.
Raymond, Charles.....	132 rue St. Jacques, Montreal.....	Ste. Julienne de Montcalm.
Rivest, J. C. L.....	Joliette.....	Joliette.
Roads Department of Quebec.....	Parliament Buildings, Quebec.....	
Robert, Pierre, fils.....	Beauport.....	Beauport.
Robichaud, Charles.....	Sto. Marie Salomée.....	Sto. Marie Salomée.
Rocheport, Léon.....	291 Notre-Dame St., Cap de la Madeleine.....	Cap de la Madeleine.
Saumure, Octave.....	Bouchette.....	Bouchette.
Savard, Cyrille.....	Loretteville.....	St. Gérard.
Sherbrooke, City of.....	City Hall, Sherbrooke.....	Orford Tp.
Sorel Sand Co., Ltd.....	82 Montcalm St., St. Joseph de Sorel.....	Rang du fleuve.
Standard Sand, Ltd.....	Joliette.....	Rang Ste. Emélie.
ONTARIO—		
Ashton, Thomas.....	1354 Queen St. E., Toronto.....	Scarboro Tp.
Benson and Patterson.....	Stamford.....	Stamford.
Boyd Bros.....	Osgoode.....	Osgoode.
Brantford, City of.....	City Hall, Brantford.....	Brantford.
Breen, Thos.....	Cheminis.....	McGarry.
Bruce, County of.....	Box 201, Walkerton.....	Brant Tp.
Cadwell Dredging Co., Ltd.....	228 Sandwich St., Windsor.....	Point Pelee.
Campbellford, Town of.....	Box 339, Campbellford.....	Campbellford.
Carroll Bros.....	490 Ellicott Square, Buffalo, N.Y., U.S.A.....	
Chatham Sand and Gravel Co.....	Wellington St., Chatham.....	Thames River.
Conlin, Herbert L.....	156 Front St. E., Toronto.....	Highland Creek.
Dereham, Tp. of.....	Mount Elgin.....	Dereham Tp.
Dibble, Wm. N.....	R.R. 7 Woodstock.....	Oxford, East Tp.
Dominion Towing and Salvage Co., Ltd.....	714 Whalen Bldg., Port Arthur.....	Lake Superior.
Dowler Bros.....	Billings Bridge.....	Billings Bridge.
Durham Sand and Stone Co., Ltd.....	402 Harbour Commission Bldg., Toronto.....	Durham.
Empire Limestone Co.....	19 Hudson St., Buffalo, N.Y., U.S.A.....	Sherkston.
Essex Transit Co., Ltd.....	30 Sandwich St., Ford City.....	Sarnia.
File, Secord.....	43 Port St., Brantford.....	Brantford.
Foster, R. R.....	278 Echo Drive, Ottawa.....	Carleton Co.
Fraser-Brace Engineering Co., Ltd.....	Montreal.....	
Fuller Gravel, Ltd.....	402 Harbour Commission Bldg., Toronto.....	Fuller.
Hinde Bros.....	134 Northland Ave., Mount Dennis.....	Mount Dennis.
Hoffmann, Jus.....	27 Pine St., Kitchener.....	Kitchener.
Homegardner Sand Co., The.....	Sandusky, Ohio, U.S.A.....	Lake Erie.
Hopkins, R. J.....	226 High St., London.....	Middlesex Co.
Huron, County of.....	Goderich.....	Huron Co.
Hydro Electric Power Commission of Ontario.....	190 University Ave., Toronto.....	(Himsworth Tp. Muskoka Tp.
Kilbourne, H. and Son.....	145 Wharnccliffe Road, London.....	(London.
Kingston Sand and Gravel Co.....	183 William St., Kingston.....	(near) Kingston.
Lake Erie Sand Co., The.....	Sandusky, Ohio, U.S.A.....	Lake Erie.
Lambton, County of.....	383 Christina St., Sarnia.....	Lambton Co.
Lapish, Fred C.....	433 Cedar St., Sault Ste. Marie, Michigan, U.S.A.....	
Lovelace, E. J.....	St. Catharines.....	(near) St. Catharines.
Maple Sand, Gravel and Brick Co.....	454 King St. W., Toronto.....	Maple.
McLean, A. B. and Sons.....	123 Spring St., Sault St. Marie.....	Lake Superior.
Nagle, Joseph.....	Dublin.....	Huron Co.
National Sand and Material Co.....	Woolworth Bldg., Welland.....	Lake Erie and Ontario.
North Dorchester, Tp. of.....	Dorchester.....	Dorchester Tp.
Ollmann Bros.....	111 Macklin St., Hamilton.....	Hamilton.
Ontario Department of Highways.....	Parliament Bldgs., Toronto.....	
Ontario Gravel Freighting Co., Ltd.....	228 Sandwich St. W., Windsor.....	Lake Erie, Lake Superior, St. Clair River.
Paris, Town of.....	Grand River St., Paris.....	Paris.
Peterborough, City of.....	133 Simcoe St., Peterborough.....	Peterborough.
Ponsonford, A. E. Estate.....	605 Talbot St., St. Thomas.....	St. Thomas.
Quick, Chas. R.....	101 Briscoe St., London.....	Westminster.
Quigley, B. C. B., Ltd.....	R.R. 1, Bartonville.....	Saltfleet Tp.
Ratchlife, E. C. B., Ltd.....	King St., Bartonville.....	Bartonville.
Regan and Blackburn.....	1550 Dufferin St., Toronto.....	Mount Dennis.
Sand and Supplies, Ltd.....	54 University Ave., Toronto.....	Waterloo.
Seebach, Ed.....	R.R. 1, Sebringville.....	Perth Co.
Seine River Improvement Co.....	1100 Builders Exchange Bldg., Minneapolis, Minn., U.S.A.....	Calm Lake.
Sherman and Hubbell.....	R.R. 5, Thamesville.....	Camden Tp.
Smythe, C., Ltd.....	506 Colonial Bldg., 11 King St. W., Toronto.....	Etobicoke Tp.

Sand and Gravel—Concluded

Name	Address	Location
ONTARIO—Concluded		
Thompson, Ernie.....	Parkhill.....	Middlesex Co.
Walsh, Matthew.....	R. R. 3, Thorndale.....	Thorndale.
Waterford Sand and Gravel Co., Ltd.....	402 Harbour Bldg., Toronto.....	Norfolk Co.
Wellington, County of.....	Guelph.....	Wellington Co.
Wilks, George.....	26 Railway St., Woodstock.....	Woodstock.
Wilcox, Hervey.....	985 Bridge St., Niagara Falls.....	Welland Co.
Windsor Sand and Gravel Co., Ltd.....	Walkerville.....	Essex Co.
Wright and Co.....	960 Queen St., Sault Ste. Marie.....	Deroche Tp.
York Sand and Gravel Co., Ltd.....	1319 Bloor St., W. Toronto.....	Middlesex Co.
Zavitz, Edgar M.....	R. R. 2, Iderton.....	
MANITOBA—		
Braid and McCurdy.....	136 Portage Ave. E., Winnipeg.....	Bird's Hill.
Brandon, City of.....	City Hall, Brandon.....	Brandon.
Building Products and Coal Co., Ltd.....	Christie St., Winnipeg.....	Woodland.
Cumming and Dobbie.....	233-9th St., Brandon.....	Brandon.
Cusson Lumber Co., Ltd.....	378 Provencher Ave., St. Boniface.....	Ste Anne.
Municipality of Rosser.....	Rosser.....	Rosser.
Riley, W. J.....	Molson.....	Molson.
Sinnott, Sylvester.....	St. Ouens.....	St. Ouens.
Winnipeg Hydro Electric System.....	59 Princess St., Winnipeg.....	Slave Falls.
SASKATCHEWAN—		
Mackenzie Supply Co., Ltd.....	Box 107, Regina.....	Regina.
North Battleford, City of.....	North Battleford.....	North Battleford.
Prince Albert, City of.....	Central Ave., Prince Albert.....	Prince Albert.
Saskatchewan Highways.....	Regina.....	
Vallance Coal and Cartage Co., The.....	35-23rd St. E., Saskatoon.....	Saskatoon.
Weyburn Storage and Distributing Co.....	Weyburn.....	Weyburn.
ALBERTA—		
Calgary Power Co., Ltd.....	401 Herald Bldg., Calgary.....	Radnor.
Cristall, L.....	10209-103 St., Edmonton.....	Edmonton.
Government of Alberta.....	Edmonton.....	
Huff Gravel, Ltd.....	708 Tegler Bldg., Edmonton.....	Heatherdown.
Spoke, J. C.....	Perryvale.....	Perryvale.
BRITISH COLUMBIA—		
Alouette Sand and Gravel Co., Ltd.....	322 Standard Bank Bldg., Vancouver.....	Vancouver.
B.C. Refractories, Ltd.....	Ft. Smythe St., Vancouver.....	Bella-Bella.
Cascade Rock and Gravel Co., Ltd.....	False Creek, Vancouver.....	Seymour Reserve.
Columbia Bitulithic, Ltd.....	500 Beatty St., Vancouver.....	Sumas Prairie Road.
Cranbrook, City of.....	Norbury Ave., Cranbrook.....	Cranbrook.
Deeks Sand and Gravel Co., Ltd.....	101-1st Ave. W., Vancouver.....	Porteau and Seymour Creek.
Gilley Bros., Ltd.....	902 Columbia St. W., New Westminster.....	Fraser River.
Hillside Sand and Gravel, Ltd.....	1083 Main St., Vancouver.....	Hillside.
Nanaimo, City of.....	Drawer 8, Nanaimo.....	Nanaimo.
Nelson, City of.....	City Hall, Nelson.....	Nelson.
Prince Rupert, City of.....	Prince Rupert.....	Prince Rupert.
Producers Sand and Gravel Co., Ltd.....	1902 Store St., Victoria.....	Royal Bay, Esquimalt.
Swinerton, Musgrave and Wilson, Estate.....	640 Fort St., Victoria.....	Metchoin.
Vancouver Island Power Co., Ltd.....	1016 Langley St., Victoria.....	Renfrew Dist.

Stone Quarrying Industry—Granite

NOVA SCOTIA—		
Bower, A. R.....	Box 255, Shelburne.....	Shelburne.
Fairview Crushed Stone Co.....	Fairview.....	Fairview.
Hoyt, C. M.....	Middleton.....	Nictaux West.
N.S. Highways.....		
Queensport Granite.....	Queensport.....	Queensport.
Rice, Elmer.....	Laurencetown.....	Nictaux West.
Rice, W. D.....	Middleton.....	Nictaux West.
NEW BRUNSWICK—		
Connolly, J. E. and D. P.....	Bathurst.....	Bathurst.
Granite Street Pavement and Construction Co., Ltd.....	Hampstead.....	Hampstead.
McGratton, H. and Sons Ltd.....	St. George.....	St. George.
Meating, Epps Co., Ltd.....	St. George.....	St. George.
		Bayside.
Milne, Coutts and Co., Ltd.....	St. George.....	St. George.
Mooney, B. and Sons, Ltd.....	112 Queen St., Saint John.....	Spoon Island.
O'Brien and Baldwin.....	St. George.....	St. George.

Stone Quarrying Industry—Granite—Concluded

Name	Address	Location
QUEBEC—		
B. and R. Granite Quarry.....	Beebe.....	Stanstead Tp.
Beebe White Granite Co., Ltd.....	Beebe.....	Beebe.
Bélanger Cement Works, Ltd.....	18th Ave. and Masson St., Montreal.	Montreal.
Bergeron, Joseph.....	Shawinigan Falls.....	Almaville.
Bergeron, Pitre.....	Chicoutimi West.....	Rang St., Ignaco.
Bernier, Auguste.....	Roberval.....	Roberval.
Blackburn, David.....	Rang St. Pierre, Chicoutimi.....	Rang St. Pierre.
Brodie's Limited.....	1070 Bleury St., Montreal.....	(Guenette. Mt. Johnson. Graniteville.
Brunet, Joseph.....	663 Côte des Neiges Road, Montreal.	Chatham Tp.
Chicoutimi, City of.....	Chicoutimi.....	Chicoutimi.
Cité de Grand Mère.....	Hotel de Ville, Grand Mère.....	Grand Mère.
Cloutier, R. E.....	Beebe.....	Beebe.
Delevalde and Goffin.....	Chicoutimi.....	Rang St. Thomas.
Dumas and St. Pierre.....	Rivière à Pierre.....	Rivière à Pierre.
Dumas, Art and Cie., Enrg.....	Rivière à Pierre.....	Rivière à Pierre.
Duncan, Wm.....	R. R. 1, Beebe.....	Beebe.
Haselton, Wm. M.....	Beebe.....	Beebe.
Lacasse and Boulais.....	Beebe.....	Beebe.
Lake St. John, Black Granite Co.....	147 Côte de la Montagne, Quebec.....	Quebec.
McIntosh, Robert.....	Beebe.....	Beebe.
Norton, S. B.....	Beebe.....	Stanstead Tp.
Page, T.....	Chicoutimi.....	Chicoutimi.
Provincial Roads Department.....	Quebec.....	
Reed, R. M. and Sons.....	R. R. 1, Beebe.....	Graniteville.
Rigaud Granite Products, Ltd.....	132 Rue St. Jacques, Montreal.....	Rigaud.
Riverin and Riverin, Enrg.....	Chicoutimi.....	Chicoutimi.
Robertson and Janin Paving Co., Ltd.....	1460 Sherbrooke St., Montreal.....	Rosemount.
Silver Granite Co., Ltd.....	117 Côte d'Abraham, Quebec.....	Frontenac Co.
Stanstead Granite Quarries Co., Ltd., The.....	Beebe.....	Graniteville.
Voyer, F. et Frère.....	Rivière à Pierre.....	Rivière à Pierre.
ONTARIO—		
Brown, R. and Son.....	376 Sparks St., Ottawa.....	Leeds Tp.
Campbell and Gzowski, Ltd.....	73 Bernard Ave.....	Findley.
	City Hall, Fort William.....	Fort William.
	Box 1025, Pembroke.....	Pembroke.
Dominion Trap Rock Co., Ltd.....	921 New Birks Bldg., Montreal, Que.	Bruce Mines.
Farmer, Geo. and Sons.....	45 Bertrand St., Ottawa.....	Renfrew County.
Fort William, City of.....	City of Fort William.....	
Gordon, D. G., Granite Co.....	239 Confederation Life Bldg., Toronto 2.....	(near) Gananoque.
Horne, Wm.....	Suite M., Ashford Block, Winnipeg, Man.....	Butler.
Hydro Electric Power Commission.....	190 University Ave., Toronto.....	Thretheway Falls.
Mond Nickel Co., Ltd., The.....	Coniston.....	McKim and Levack Tps.
Morrison, Wm.....	Peninsula.....	Peninsula.
Ontario Rock Co., Ltd.....	410 Crown Office Bldg., Toronto.....	Belmont and Methuen Tps.
Pembroke, Town of.....	Box 1025 Pembroke.....	Pembroke.
Quinn Stone and Ore Co., Ltd.....	Box 160, Fort William.....	Fort William.
Routly, H.....	Richmond St. E., Toronto.....	Jarvis, Georgetown, Kincardine.
BRITISH COLUMBIA—		
B.C. Monumental Works, Ltd.....	2250 Main St., Vancouver.....	Granite Island.
Coast Quarries, Ltd.....	837 Hastings St. W., Vancouver.....	Granite Falls.
Gilley Bros., Ltd.....	902 Columbia St. W., New Westminster.....	
Nelson, City of.....	City Hall, Nelson.....	Nelson.
Nelson Granite and Monumental Co.....	Box 865, Nelson.....	Nelson.
Poignant, C. E. and C. G.....	Matsqui.....	Matsqui.
Prince Rupert, City of.....	Prince Rupert.....	Prince Rupert.
Vancouver Granite Co., Ltd.....	543 Granville St., Vancouver.....	Nelson Island.
Vernon Granite and Marble Co.....	Box 285, Vernon.....	Okanagan Landing.
Western Granite Co., Inc.....	202 Lloyd Bldg., Seattle, Wash.....	Ymir.
Wilson, James S.....	Sirdar.....	Sirdar.
MANITOBA—		
Carter-Halls-Aldinger Co. Ltd.....	400 Royal Bank Bldg., Winnipeg.....	Great Falls.

Stone Quarrying Industry—Limestone

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.....	Sydney.....	Pt. Edward, C.B.
Eastern Lime Co., Ltd.....	Windsor.....	Windsor.
Kennedy and Porter.....	Box 601, Stellarton.....	Pictou.
NEW BRUNSWICK—		
Brookville Manufacturing Co., Ltd.....	Brookville.....	Brookville.
Peters, C. H., and Sons, Ltd.....	71 Dock St., Saint John.....	Torriburn.

Stone Quarrying Industry—Limestone—Continued

Name	Address	Location
QUEBEC—		
Bathurst Co., Ltd.	Bathurst, N.B.	Port Daniel.
Baron, A.	St. Dominique de Bagot.	St. Dominique.
Beaudry, Joseph P.	Tache St., Joliette.	Joliette.
Canada Cement Co., Ltd.	Canada Cement Co. Bldg., Montreal.	Hull.
Carrière, St. Laurent, Ltd.	Giffard.	Giffard.
Charron, Arthur.	Village Bélanger.	Village Bélanger.
Château Richer Quarry, Ltd.	Château Richer.	Château Richer.
Dept. du Parc, Maisonneuve.	Hotel-de-Ville, Montreal.	Maisonneuve.
Cité de Valleyfield.	Valleyfield.	Valleyfield.
Cousineau, Alderic.	5697 St. Urbain St., Montreal.	Montreal.
Delorimier and Rogers Quarries, Ltd.	4901 Iberville St., Montreal.	Montreal.
De Sales Quarry, Ltd.	466 Viau St., Montreal.	St. François de Sales.
Deschambault Quarry Corporation.	52 St. Paul St., Quebec.	St. Marc des Carrières.
Desormeaux, Edgar.	Cap St. Martin.	Cap St. Martin.
Dominion Lime Co., The.	East Angus.	Lime Ridge.
Duke-Price Power Co., Ltd.	Canada Cement Bldg., Montreal.	Roberval.
Dupré, Arthur.	St. Michel.	St. Michel.
Durocher, Cyrille.	11021 Notre Dame E., Montreal.	Carrière Durocher.
Faubert, Alphonse.	Ville de Lery.	Ville de Lery.
Filion, Adélar.	Lachûte.	Lachûte.
Fraser-Brace Engineering Co., Ltd.	107 Craig St. W., Montreal.	Paugan Falls.
Fuger and Smith, Ltd.	Pointe Claire.	Pointe Claire.
Gagnon, Martin.	7794 St. Andrew St., Montreal.	Montreal.
Gaspesian Fertilizer Co.	Port Daniel East.	Port Daniel East.
Gauthier, Oliver.	St. Marc des Carrières.	St. Marc des Carrières.
Gingras and Bros., Ltd.	St. Marc des Carrières.	St. Marc des Carrières.
Giroux, J. H. and Co.	27 Rue Plaisante, Three Rivers.	Three Rivers.
Gravel, Ed. L.	Château Richer.	Château Richer.
Guilbault, Frères et Cie.	Ste. Elizabeth.	Ste. Elizabeth.
Kennedy Construction Co., Ltd.	407 McGill St., Montreal.	St. François de Sales.
Lacoulin, L.	Château Richer.	Château Richer.
Lapointe, Emile.	St. Dominique de Bagot.	St. Dominique.
Lapointe, Jos.	12034 Montée St. Laurent, Montreal.	Cartierville.
Laurentian Stone Co., Ltd.	250 Catherine St., Ottawa, Ont.	Hull.
Laval Quarry Co., Ltd.	Cap St. Martin.	Cap St. Martin.
Leclerc, Edouard.	St. Jochim de Montmorency.	St. Jochim.
Leclerc, V.	8369 St. Denis St., Montreal.	Cap St. Martin.
Lyall, P. and Sons Construction Co., Ltd.	132 St. James St., Montreal.	St. Vincent de Paul.
Maisonneuve Quarry Co., Ltd.	4740 Iberville, Montreal.	4415 Rosemount Bldv., Montreal.
Martineau, O. and Sons, Ltd.	515 Marie Anne St. E., Montreal.	Montreal.
Ministère de la Voirie.	Quebec.	Quebec.
Montreal Crushed Stone Co., Ltd.	2020 Union Ave., Montreal.	St. Vincent de Paul.
Montreal Harbour Commission.	Montreal.	Montreal.
Noel, Oscar et Cie.	Tracy St., Wrightville, Hull.	Wrightville.
Page, Jos.	Charlesbourg, West.	Charlesbourg.
Paquette, Damien.	Village Bélanger.	Cap St. Martin.
Paquette, Lévis et Cie.	Cap St. Martin.	Cap St. Martin.
St. Laurent Quarry, Ltd.	Cap St. Martin.	Cap St. Martin.
St. Michel Quarry, Ltd.	St. Michel de Laval, Montreal.	Cap St. Martin.
St. Vincent de Paul Penitentiary.	St. Vincent de Paul.	St. Michel de Laval.
Shawinigan Chemicals, Ltd.	83 Craig St. W., Montreal.	St. Vincent de Paul.
Société Co-opérative Agricole de Calcaire de Mississquoi.	Bedford.	Montreal.
Simard, Alfred.	Chambly Basin.	Bedford.
Standard Lime Co., Ltd.	Joliette.	Chambly Basin.
Stinson-Reeb Builders Supply Co., Ltd.	360 Dorchester St. W., Montreal.	St. Paul de Joliette.
Stone and Quarry, Ltd.	1340 Bellechasse, Montreal.	Côte St. Michel de Laval.
Standard Lime Co., Ltd.	Joliette.	St. François de Sales.
Theoret, Magloire.	Bellerive.	Montreal.
Therrien, Maxine.	Village Bélanger.	St. Paul de Joliette.
Tremblay, Nap.	Joffre Ave., Hull.	Bellerive.
Varin et Barbin.	Ville St. Michel.	Cap St. Martin.
Verreault, Elzear, Ltd.	194 rue du Pont, Quebec.	Hull.
Villeray Quarry Co., Ltd.	4740 Iberville, Montreal.	Vill. St. Michel.
West End Quarry, Ltd.	Trois and Decelles Ave., Montreal.	Giffard.
White Grit Co.	Hurdman Road, Ottawa.	Montreal.
Wright and Co., Inc.	250 Catherine St., Ottawa.	Portage du Fort.
ONTARIO—		
Barton Tp. Quarry.	Court House, Hamilton.	Hull.
Beachville White Lime Co., Ltd.	Beachville.	Barton Tp.
Bilbie, C. V.	510 Oxford Ave., Montreal, Que.	Beachville.
Bolender Bros.	Haliburton.	(Lombardy.
Bio Mica Co., Ltd, The.	324 Northcliffe Ave., Montreal, Que.	Meath.
Bourgie, J. B.	Box 79, Embrun.	Haliburton.
Boule, E. D. and Sons, Ltd.	Billings Bridge.	Verona.
Brunner Mond, Canada, Ltd.	Canadian Bank of Commerce Bldg., Toronto.	Embrun.
Canada Cement Co., Ltd.	Canada Cement Co., Bldg., Montreal, Que.	Hogs Back.
Canada Crushed Stone Corp., Ltd.	72 Sun Life Bldg., Hamilton.	Anderdon Tp.
		Thurlow Tp.
		Dundas.

Stone Quarrying Industry—Limestone—Concluded

Name	Address	Location
ONTARIO—Concluded		
Carleton County.....	Court House, Ottawa.....	Ottawa.
Cartmell, John.....	Thorold.....	(near) Thorold. (St. Albert.
Cloutier and Grenon.....	Casselman.....	Limoges. Russel.
Cook, J. S.....	Warton.....	Amabel Tp.
Cooper, Alf. and Co.....	506½ Victoria Ave., Fort William.....	Fort William.
Crystallite Stone Products, Ltd.....	21 Main St., Hamilton.....	Hastings Co.
Dibblee Construction Co., Ltd.....	758 Victoria Sq., Montreal, Que.....	Carleton Co.
Foster, R. R.....	278 Echo Drive, Ottawa.....	Merivale Road.
Gordon Crushed Stone Co., Ltd.....	239 Confederation Life Bldg., To- ronto.....	Hagersville.
Grenville Crushed Rock Co., Ltd.....	Oxford Mills.....	Oxford Tp.
Hagersville Contracting Co., Ltd.....	72 Sun Life Bldg., Hamilton.....	Walpole Tp.
Hagersville Quarries, Ltd.....	Hagersville.....	Walpole Tp.
Harvey, W. H. and Son.....	Deseronto.....	Johnstown.
Henniger, M. G.....	Smith's Falls.....	Goulbourn Tp.
Humberstone Township Quarry.....	Humberstone.....	Humberstone.
International Nickel Co. of Canada, Ltd.....	Dominion Bank Bldg., Toronto.....	McK m and Levack Tps.
Irvine, Edgar, Co., Ltd., The.....	Alexandria.....	(near) Bath.
Keeling, James.....	1179-16th St. E., Owen Sound.....	8th Ave. E., Owen Sound.
Kingdon Mining, Smelting and Manufacturing Co., Ltd.....	314 Beaver Hall Hill, Montreal, Que.....	Galetta.
Kingston Penitentiary.....	Portsmouth.....	Portsmouth.
Kirkfield Crushed Stone, Ltd.....	Fleet and Bathurst Sts., Toronto 2.....	Kirkfield.
Langton, Thomas.....	Coldwater.....	Medonte Tp.
Lapierre, M.C.....	1994 9th Ave. E., Owen Sound.....	Owen Sound.
Law Construction Co., Ltd.....	625 Confederation Life Bldg., To- ronto 2.....	Craigleith.
Lincoln County Quarry.....	St. Catharines.....	St. Catharines.
Longford Quarry Co., Ltd.....	6 Peter St., Orillia.....	Orillia.
McGinnis and O'Connor.....	Kingston.....	East of Nananee.
McLean, H. C.....	115 Adolphus St., Cornwall.....	Portland.
McQuigge, J. R.....	Arnprior.....	Ramsay Tp.
Middleton, J. N.....	Ancaster.....	Ancaster.
Milligan, F.....	Iroquois.....	Iroquois.
Oliver Rogers Stone Co., Ltd., The.....	719-4th Ave. E., Owen Sound.....	Owen Sound.
Ontario Reformatory Industries.....	Parliament Bldgs., Toronto.....	Guelph Tp.
Pembroke, Town of.....	Box 1025, Pembroke.....	Pembroke.
Perkins, George A.....	330-6th Ave. W., Owen Sound.....	Owen Sound.
Pirson, John.....	Stevensville.....	Stanford Tp.
Queenston Quarries, Ltd.....	72 Sun Life Bldg., Hamilton.....	Niagara Tp.
Quinton, W. G.....	Jasper.....	Jasper, Merrickville.
Ritchie Cut Stone Co., The.....	Hamilton.....	Shelburne.
Robertson, D. and Co., Ltd.....	26 Queen St. E., Toronto.....	Nassagaways Tp.
Robillard, H. and Son.....	195 Nicholas St., Ottawa.....	Gloucester Tp.
Roddy, J. M.....	293 Division St., Kingston.....	Frontenac Co.
Routly, H. T.....	9 Richmond St. E., Toronto.....	Rawdon Tp.
Standard White Lime Co., Ltd.....	15 Douglas St., Guelph.....	Beachville.
Stormont, Dundas and Glengarry, Counties of.....	County Bldg., Cornwall.....	Finch Tp.
Walker Bros.....	Box 786, Thorold.....	Stamford Tp.
Welland Ship Canal.....	St. Catharines.....	St. Catharines.
Wentworth, County of.....	Court House, Hamilton.....	Barton Tp.
Wentworth Quarries, Ltd.....	72 Sun Life Bldg., Hamilton.....	Saltfleet Tp.
Windmill Point Crushed Stone Co., Ltd.....	625 Confederation Life, Bldg., To- ronto.....	Ridgeway.
Winnipeg Roofing Co., Ltd.....	264 Berry St., St. Boniface, Manitoba.....	Silver Mountain.
MANITOBA—		
Gillis Quarries, Ltd.....	Spruce and Richard Sts., Winnipeg.....	Garson.
Moosehorn Lime Co.....	214 Avenue Bldg., Winnipeg.....	Winnipeg.
Tyndall Quarry Co., Ltd.....	1591 Erin St., Winnipeg.....	Winnipeg.
Western Stone Co., Ltd., The.....	601 Confederation Life Bldg., Win- nipeg.....	Garson.
Winnipeg, City of.....	Winnipeg.....	Stony Mountain.
Winnipeg Supply and Fuel Co., Ltd.....	214 Avenue Eldg., Winnipeg.....	Winnipeg.
ALBERTA—		
Loder's Lime Co., Ltd.....	Kananaskis.....	Kananaskis.
Summit Lime Works.....	Box 273, Lethbridge.....	Lethbridge.
West Canadian Collieries, Ltd.....	Blairmore.....	Blairmore.
BRITISH COLUMBIA—		
B.C. Refractories, Ltd.....	Ft. Smythe St., Vancouver.....	Bella-Bella.
Consolidated Mining and Smelting Co. of Canada, Ltd.....	Trail.....	Fife.
Pacific Lime Co., Ltd.....	744 Hastings St. W., Vancouver.....	Texada Island.
Powell River Co., Ltd.....	Powell River.....	Texada Island.
Teale, J. F.....	Bella-Bella.....	Cunningham Island.
Walleen, J. J.....	3472 Bethune Ave., Victoria.....	Quatsino.

Stone Quarrying Industry—Marble

Name	Address	Location
QUEBEC—		
Brassard, Ovide.....	L'Annonciation.....	L'Annonciation.
Wallace Sandstone Quarries, Ltd.....	132 St. James St., Montreal.....	Philipsburg.

Stone Quarrying Industry—Sandstone

NOVA SCOTIA—		
Wallace Sandstone Quarries, Ltd.....	132 St. James St., Montreal.....	Wallace.
NEW BRUNSWICK—		
Dobson, Frank.....	Dorchester.....	Rockland.
Miramichi Quarry Co., Ltd.....	Quarryville.....	Quarryville.
Read Stone Co.....	Stonehaven.....	Stonehaven.
QUEBEC—		
Blais, Jos., Engr.....	8 Mont Marie Ave., Lévis.....	Lévis.
Bourbonnais, J. A.....	Dorion.....	Dorion.
Carrière de Lévis, Ltd.....	82 Richelieu St., Quebec.....	St. David.
Gagnon, Louis Philippe.....	St. David.....	St. David.
Northern Construction Co., Ltd.....	605 Confederation Bldg., Montreal...	Quebec.
Sherbrooke, City of.....	Sherbrooke.....	Sherbrooke.
ONTARIO—		
Credit Valley Quarries, Ltd.....	C.N.R. Florence St., Toronto 3....	Glen Williams, Terra Cotta.
Logan, Hugh.....	Glen Williams.....	Glen Williams.
Robertson, D. and Co., Ltd.....	26 Queen St. E., Toronto.....	Toronto.
Thompson, Fred.....	Glen Williams.....	Glen Williams.
BRITISH COLUMBIA—		
Cranbrook, City of.....	Norbury Ave., Cranbrook.....	Cranbrook.

APPENDIX ONE

EXPLANATORY NOTES

Method of Computing Values Shown in Reports on the Mineral Production of Canada.

For statistical and comparative purposes it has always been customary to determine the value of the metals on the basis of the quantities recovered from Canadian ores smelted during the year either in Canada or abroad; in making up values the general practice is to use the average price of the refined metal in a recognized market. During 1926 some changes were made in the methods in use. The following notes have been prepared so that the reader may know how the figures for quantities and values have been computed.

Antimony.—Recoverable metal in shipments made, valued at the average New York price for the fine metal.

Arsenic.—(a) Recoverable arsenic in concentrates exported at an arbitrary value; (b) White arsenic shipped from Canadian smelters at its sales value.

Bismuth.—Recoverable bismuth metal in the silver-lead-bismuth bullion shipped to foreign smelters for refining, at an arbitrary value.

Cobalt.—Cobalt content of the various cobalt products sold by south Ontario smelters added to the cobalt content of ores and residues exported for treatment in foreign smelters: the value given is the net amount received by the shippers.

Copper.—1. Dominion Bureau of Statistics practice up to the end of 1925 was to include as the production of copper, data obtained from the following sources:—

- (a) Copper in matte made by the International Nickel Company and the Mond Nickel Company at their smelters in the Sudbury area;
- (b) Copper in cobalt-nickel and gold ores exported, deductions being made as follows:
 - (1) Copper in concentrates from gold ores less 26 pounds per ton of concentrates;
 - (2) Copper paid for in concentrates from silver-cobalt ores;
 - (3) Copper in concentrates exported (from Quebec) less 20 pounds per ton of concentrates;
 - (4) Blister copper produced at the Trail and Granby smelters;
 - (5) Copper in Britannia mine shipments of concentrates less 10 pounds per ton of concentrates;
 - (6) Copper in all other copper-bearing ores exported less 20 pounds per ton of concentrates.

2. The sum of production as thus determined was valued at the monthly average New York market price for electrolytic copper.

3. Consensus of opinion was that the foregoing method resulted in a higher valuation being put on copper production from Ontario ores than was actually obtained by Canadian producers, and it was held that practice in Ontario would be improved by measuring the copper production at its most advanced state within the province. Formerly, calculations were based on the copper content of matte made at the smelters in the Sudbury area; the method in use in 1926 and 1927 includes in the item "Production," the copper produced at Port Colborne and the copper in matte and ores exported.

- (a) There has been no change in method either in respect to quantities or values except in the province of Ontario; while it may be suggested that the production of copper from Trail ought to be measured at the refinery rather than at the smelter, it is not considered desirable to make this change at the present time, owing to the fact that the copper refinery in question operates only intermittently whereas the copper smelter has a more continuous record. There may be some disposition to discuss the deductions that ought to be allowed in connection with shipments of copper ores for export, but it is thought this possible change in practice would not be of great moment and it is therefore passed over at the present time;

APPENDIX ONE—*Continued*

(b) In computing Ontario's production of copper the procedure is as follows:—

- (1) Copper content of converter copper made at Port Colborne, the value for this output being computed *pro rata* according to the income from sales of copper during the year (as reported by the International Nickel Company of Canada);
- (2) Copper in matte exported from the smelters of the Sudbury area valued at an arbitrary figure agreed upon between the Bureau of Statistics and the Ontario Department of Mines;
- (3) Copper in concentrates from gold ores less 26 pounds per ton of concentrates valued at the monthly average New York price for electrolytic copper;
- (4) Copper paid for in concentrates from silver-cobalt ores exported, at its sales value as reported by the shippers.

Gold.—Gold in bullion produced and the recoverable gold in all other Canadian mine products valued at the standard rate of \$20.671834 per fine ounce.

Iron Ore.—Export tonnages and sales values.

Lead.—1. Dominion Bureau of Statistics practice up to the end of 1925 was to evaluate the recoverable lead from all sources at the average price prevailing on the Montreal market during the year.

2. Examination of the returns made to the Bureau shows that sales of lead in ores from the province of Quebec and to the extent of about 80 per cent of the lead sold from Trail, are made on the basis of London quotations; approximately 20 per cent of the lead sold from Trail is marketed in Canada.

3. Lead from Ontario ores finds its market in Canada.

4. Lead ores exported from British Columbia and from the Yukon to points in the United States are subject to a duty of $1\frac{1}{2}$ cents per pound of lead content (lead in base bullion takes a rate of $2\frac{1}{2}$ cents per pound). The difference between the London and New York quotations is approximately equivalent to the duty charge on each pound of lead imported into the United States.

In view of the foregoing facts the following procedure for the evaluation of lead from Canadian ores has been adopted:—

- (a) Ontario—Galletta sales, quantity and value.
- (b) Recoverable lead in ores exported from Quebec, Yukon and British Columbia as well as lead in base bullion made at Trail valued at the average London quotations during the year as given in the *Engineering and Mining Journal*, the English quotations being converted to Canadian funds at par (\$4.86666).

Molybdenite.—Shipments in terms of MoS_2 at their sales value.

Nickel.—Prior to 1925 it was customary in Dominion reports to compute the nickel production of Canada as the sum of the quantity of nickel contained in matte made at the Sudbury smelters and the nickel contained in smelter products from silver-cobalt ores; the value was computed at the average New York market price for virgin nickel. But as all Canada's nickel is derived from Ontario ores, and as the method used by the Ontario Department of Mines differed from Dominion Bureau of Statistics practice, a conference was arranged during 1925, with a view to harmonizing the statistics on nickel. As a result of this conference it was agreed that both offices should compute the quantity and value of nickel production as follows:—

- (a) Nickel in matte exported from Canada valued at an arbitrary figure agreed upon between the two offices—(representative of the value of nickel in matte);
- (b) Refined and electrolytic nickel produced at Canadian refineries valued at the average price obtained for such products sold during the year;
- (c) Nickel in nickel oxide or salts sold from Canadian smelters and refineries at its total selling value in the form in which it was sold;
- (d) Nickel contained in speiss residues exported, valued at the same price as allowed for nickel in matte.

APPENDIX ONE—*Concluded*

Platinum group metals.—Recoverable metals in smelter products at their sales value to the producer and placer platinum at the average New York price for the year.

Silver.—Silver bullion produced and the recoverable silver in other smelter products, and the recoverable silver in Canadian ores exported, at the average New York price for the refined metal.

Zinc.—Refined zinc produced at Trail and the recoverable zinc in concentrates exported, valued at the average monthly price quoted in London, exchange conversion being made at par.

Coal.—Output tonnage evaluated *pro rata* according to income from sales.

Other Non-Metallic Minerals, Clay Products and Structural Materials.—Shipments during the year at their respective sales values.

Imports.—Statements of quantities and values are based on the declarations of importers, as subsequently checked by government officials.

The value of imported merchandise is the fair market value or the price thereof when sold for home consumption in the principal markets of the country whence and at the time when the same were exported directly to Canada. The *price* and *value* of the goods in every case are stated as in condition packed ready for shipment, the fair value being shown in the currency of the country of export, and the selling price to the purchaser in Canada shown in the actual currency in which the goods were purchased. In the case of goods that are the manufacture or produce of a foreign country, the currency of which is substantially depreciated, the value stated is the value that would be placed on similar goods manufactured or purchased in the United Kingdom and imported from that country, if such similar goods are made or produced there. If similar goods are not made or produced in the United Kingdom, the value stated is the value of similar goods made or produced in any European country, the currency of which is not substantially depreciated.

Exports.—Statements of quantities and values are based on the declaration of exporters as subsequently checked by government officials.

The value of exports of Canadian merchandise is the actual cost or the value at the time of exportation at the points in Canada whence originally shipped.

Weight.—Weight, where shown in imports and exports is the net weight of the goods, excluding the weight of the covers or receptacles, except in the cases of certain goods, as provided in the tariff.

The expression *ton* means 2,000 pounds, and *cwt.* 100 pounds, avoirdupois. Where other units of quantity are used, imperial standards apply.

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Iron and Steel and Their Products: Pig Iron and Ferro-Alloys—Steel and Rolled Products — Castings and Forgings — Boilers, Tanks and Engines — Agricultural Implements — Machinery — Automobiles—Auto Accessories—Bicycles—Railway Rolling Stock—Wire and Wire Goods—Sheet Metal Products—Hardware and Tools—Miscellaneous Iron and Steel Products, n.e.s.

Manufactures of Non-Ferrous Metals: Aluminium Products—Brass and Copper Products—Lead, Tin and Zinc Products—Precious Metal Products—Electrical Apparatus and Supplies—Miscellaneous Non-Ferrous Metal Products—Non-Ferrous Smelting and Refining.

Manufactures of Non-Metallic Minerals: Aerated Waters—Asbestos and Allied Products—Cement—Cement Products—Coke and Gas—Glass (blown, cut, ornamental, etc.)—Lime—Petroleum Products—Products from Domestic Clays—Products from Imported Clays—Salt—Sand—Lime Brick—Stone, Dressing—Miscellaneous Non-Metallic Mineral Products, including (a) Abrasive Products, (b) Artificial Graphite and Electrodes, (c) Gypsum Products, (d) Mica Products.

Chemicals and Allied Products: Coal Tar Products—Acids, Alkalies, Salts and Compressed Gases—Explosives, Ammunition, Fireworks and Matches—Fertilizers—Medicinal and Pharmaceutical Preparations—Paints, Pigments and Varnishes—Soaps, Washing Compounds and Toilet Preparations—Inks, Dyes and Colours—Wood Distillates and Extracts—Miscellaneous Chemical Products, including (a) Adhesives, (b) Baking Powder, (c) Boiler Compounds, (d) Celluloid Products, (e) Flavouring Extracts, (f) Insecticides, (g) Polishes and Dressings, (h) Sweeping Compounds, (i) Chemical Products, n.e.s.

Annual Bulletins.—In addition to the foregoing printed reports, a series of bulletins is issued annually, each of which presents the principal statistics relative to production: (a) in a particular industry, e.g., Automobiles, Petroleum Products, etc., (b) in each of the four main groups of industries. These are published in mimeograph form from time to time during the year as the necessary material becomes available.

Monthly—

Production of Iron and Steel in Canada.

Coal and Coke Statistics for Canada.

Automobile Statistics for Canada.

SPECIAL REPORTS—

Report on the Consumption of Prepared Non-Metallic Minerals in Canada.

Report on the Consumption of Mine and Mill Materials in Canada.

Report on the Consumption of Coke in Canada.

Annual Summary Report on the Mineral Industry and the Manufacturing Industries Related Thereto.

The Fertilizer Trade in Canada, July 1, 1926-June 30, 1927.

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CANADA—DEPARTMENT OF TRADE AND COMMERCE
DOMINION BUREAU OF STATISTICS
MINING, METALLURGICAL AND CHEMICAL BRANCH

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1929

Published by Authority of the Hon. H. H. Stevens, M.P.,
Minister of Trade and Commerce



OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1931

Price, 50 cents



LIST OF PUBLICATIONS

PREPARED IN THE

MINING, METALLURGICAL AND CHEMICAL BRANCH

DOMINION BUREAU OF STATISTICS

MINERAL PRODUCTION (Mining and Metallurgy)

General Reports.

Preliminary Reports (semi-annual) on the Mineral Production of Canada.

Monthly Report on Canada's Leading Mineral Products.

Annual Report on the Mineral Production of Canada. (In one volume).

A comprehensive record of the mining industry embodying historical and world data, detailed information on mineral production, imports and exports for Canada and general statistics relative to the mining industry on capital investment, employment, fuel consumption and power equipment arranged in 10 chapters each dealing with a particular branch of the industry. Statistics on production and trade in mineral products appear in detail in the appropriate chapters. A list of operating companies with their office and plant addresses is included. Fully indexed. Chapter titles are: Canada—The Gold Mining Industry—The Silver Mining Industry—The Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries—Directory of Reporting Firms—Notes on the Methods of Computing Values—Index.

Coal—

Monthly and Quarterly Reports on Coal and Coke Statistics for Canada.

A condensed report on production, imports and exports of coal and coke is issued monthly, publication being made about the twentieth of the next following month.

A more general review is published quarterly, showing statistics for each month, for the quarter, and for the year to date on the output by coal-mining districts and by provinces, imports and exports by ports and by kinds of coal, employment in coal-mining, and tonnage lost. There is also a section on coke showing production, imports, exports, distribution and consumption by months and by provincial groups.

Annual Report on Coal Statistics for Canada.

Text and tables showing for Canada, and for each of the coal-producing provinces, historical and current data on output, tonnage lost, disposition of coal from the mines, domestic and foreign shipments, exports and imports by ports, consumption of coal, prices, employment, salaries and wages paid, power equipment, capital investment, etc.

Annual Bulletins—

(a) MINERAL PRODUCTION—

Metals.—Arsenic—Cobalt—Copper—Gold—Lead—Nickel—Metals of the Platinum Group—Silver—Zinc—Miscellaneous Metals including Aluminium, Antimony, Chromite, Iron ore, Manganese, Mercury, Molybdenum, Tin, Tungsten.

Non-Metals.—Abrasives—Asbestos—Coal—Feldspar—Gypsum—Iron Oxides—Mica—Natural Gas—Petroleum—Quartz—Salt—Talc and Soapstone—Miscellaneous Non-Metallic Minerals including Actinolite, Barytes, Fluorspar, Graphite, Magnesite, Magnesium Sulphate, Mineral Waters, Natro-Alunite, Peat, Phosphate, Pyrites, Sodium Carbonate, Sodium Sulphate.

Structural Materials.—Cement—Clay and Clay Products—Lime—Sand and Gravel Stone and Slate.

(b) MINERAL INDUSTRY.—Each bulletin of this group shows in synopsis, material to be published subsequently as one chapter of the annual report on the *Mineral Production of Canada*. These bulletins are published in mimeograph form from time to time during the year as the necessary material becomes available.

By Industries.—Gold Mining Industry including Alluvial Gold Mining, Auriferous Quartz Mining and Copper-Gold-Silver Mining—Silver-Cobalt and Silver-Lead-Zinc Mining Industry—Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries.

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NOTES ON STATISTICS OF PRODUCTION

In the collection of production data, the Dominion Bureau of Statistics makes a division between primary and secondary production. In the first-named class, there are separate sections for the collection of statistics on (a) **Agricultural Products**, (b) **Furs**, (c) **Fish**, (d) **Forest Products**, (e) **Mineral Products**.

In the second are included (a) **Manufacturing** and (b) **Construction**.

Manufacturing is subdivided into nine groups of industries, producing concerns being classified according to the principal component material of their major products. For example, manufactures of leather goods are classified under "Animal Products"; the pulp and paper industry under "Wood and Paper," etc. An outline of the scheme of classification in use for manufacturing industries is given below:—

Manufactures of:

- (1) **Vegetable Products**, including—Coffee and Spices; Cocoa and Chocolate; Preserved and Canned Products; Pickles, Vinegar and Cider; Flour and Cereals; Bread and other Bakery Products; Macaroni and Vermicelli; Distilled and Brewed Liquors and Wines; Rubber Products; Starch and Glucose; Sugar; Tobacco Products; Linseed Oil and Oil Cake.
- (2) **Animal Products**, including—Fish and Fish Products; Dairy Factory Products; Meat and Meat Products; Leather and Leather Products; Furs and Fur Products.
- (3) **Textiles and Textile Products**, including—Cotton Textiles (Cloth, Yarn, Thread and Waste); Woollen Textiles (Cloth, Yarn, Blankets, Felt and Waste); Silk Products; Factory-Made Clothing, Carpets, Rugs and Mats; Cordage, Rope and Twine.
- (4) **Wood and Paper**, including—Pulp and Paper Mill Products; Paper Goods; Printing, Publishing and Lithographing; Saw and Planing Mill Products; Furniture, Carriages, Wagons and Sleighs; Wooden Containers; Woodenware; Turned Wood Products; and the Output of Similar Wood-Using Industries.
- (5) **Iron and Steel and their Products**, including—Pig Iron and Ferro-Alloys; Steel and Rolled Products; Castings and Forgings; Boilers, Tanks and Engines; Agricultural Implements; Machinery; Automobiles; Auto Parts and Accessories; Bicycles; Railway Rolling Stock; Wire and Wire Goods; Sheet Metal Products; Hardware and Tools; Miscellaneous Iron and Steel Products.
- (6) **Manufacture of Non-Ferrous Metals**, including—Aluminium Products; Brass and Copper Products; Lead, Tin and Zinc Products; Jewellery and Silverware; Electrical Apparatus and Supplies; Miscellaneous Non-Ferrous Metal Products; Non-Ferrous Smelting and Refining.
- (7) **Manufactures of the Non-Metallic Minerals**, including—Aerated Waters; Asbestos and Allied Products; Cement; Cement Products; Coke and Gas; Glass (blown, cut, ornamental, etc.); Lime; Petroleum Products; Products from Domestic Clays; Products from Imported Clays; Salt; Sand-Lime Brick; Stone Dressing; Miscellaneous Non-Metallic Mineral Products, including (a) Artificial Abrasives and Abrasive Products, (b) Artificial Graphite and Electrodes, (c) Gypsum Products, (d) Mica Products, (e) Miscellaneous Non-Metallic Mineral Products, n.e.s.
- (8) **Chemicals and Allied Products**, including—Coal Distillation; Acids, Alkalies and Salts; Compressed Gases; Explosives, Ammunition and Fireworks; Fertilizers; Medicinal and Pharmaceutical Preparations; Paints, Pigments and Varnishes; Soaps and Washing Compounds; Toilet Preparations; Inks; Adhesives; Polishes and Dressing; Wood Distillates and Extracts; Miscellaneous Chemical Products including (a) Baking Powder, (b) Foiler Compounds, (c) Plastics, (d) Insecticides, (e) Sweeping Compounds, (f) Disinfectants; (g) Matches, (h) Dyes and Colours, (i) Chemical Products, n.e.s.
- (9) **Miscellaneous Products**, including—Brooms and Brushes; Electric Light and Power; Musical Instruments, etc.

The statistics of manufactures are also classified according to the **use** or **purpose** of the end product as follows:—

- (1) **Food**, including—Breadstuffs; Fish; Nuts; Fruits and Vegetables; Meats; Milk Products; Oils and Fats; Sugar; Infusions; Miscellaneous.
- (2) **Drink and Tobacco**, including—Beverages, alcoholic; Beverages, non-alcoholic; Tobacco.
- (3) **Clothing**, including—Boots and Shoes; Fur Goods; Garments and Personal Furnishings; Gloves and Mitts; Hats and Caps; Knitted Goods; Waterproofs; Miscellaneous.
- (4) **Personal Utilities**, including—Jewellery and Time-Pieces; Recreational Supplies; Personal Utilities, n.e.s.
- (5) **House Furnishings**.
- (6) **Books and Stationery**.
- (7) **Vehicles and Vessels**.
- (8) **Producers' Materials**, including—Farm Materials; Manufacturers' Materials; Building Materials; General Materials.
- (9) **Industrial Equipment**, including—Farming Equipment; Manufacturing Equipment; Trading Equipment; Service Equipment; Light, Heat and Power Equipment; General Equipment.
- (10) **Miscellaneous**.

PREFACE

Statistical reports on the mineral production of Canada have been issued annually for many years, first by the Geological Survey, later by the Mines Branch of the Department of Mines, and since 1921 by the Dominion Bureau of Statistics. In addition to production figures on the many metals, non-metals and structural materials produced in Canada, statistics on capital employed in the mining industry, salaries and wages paid, number of employees, and fuel and power consumed are also made available, and in order that a student of the mineral industry may have complete data, imports into, and exports from Canada of minerals and mineral products and world tables of production have been included.

Nineteen twenty-nine was a record year in the mineral industry of the Dominion. Production of many of the principal metals was greater than ever before, and although coal output was slightly under that of 1928 the total value of the fuels group was higher than in the previous year; many other non-metallics, the principal items of which were asbestos, gypsum and salt, showed increases, and the output of structural materials such as cement, lime, clay products, stone, and sand and gravel, reflected active building conditions. But not only in production does 1929 stand out. It was also a year of great activity in the development of new mining properties, the construction of new mills and smelters, and the enlargements of existing mining and metallurgical plants. These conditions prevailed in all the major mineral producing provinces and in addition Manitoba, heretofore thought of principally as an agricultural province, will in 1930 for the first time have a smelter output of copper and zinc.

As in former years the Bureau has continued to co-operate with the provinces of Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia in the collection of coal statistics; and with the provinces of Quebec, Ontario and British Columbia in the collection of annual mineral production returns, thereby lessening the work of the mine and smelter operators in the matter of making returns and also tending to make the compilations more uniform as between the provinces and the Dominion. The Bureau desires to acknowledge its indebtedness to the provincial governments and to other Dominion departments for the valuable assistance rendered in connection with this report.

The thanks of the Bureau are also tendered to mine and smelter operators for assistance given and information made available. The railway and other transportation companies as well as smelter operators outside of Canada have also furnished data, receipt of which is gratefully acknowledged.

The report has been prepared under the direction of Mr. W. H. Losee, B.Sc., chief of the Mining, Metallurgical and Chemical Branch of the Bureau, by Mr. R. J. McDowall, B.Sc., who was assisted by Mr. B. R. Hayden of the Mineral division staff.

R. H. COATS,

Dominion Statistician.

DOMINION BUREAU OF STATISTICS,

OTTAWA, May 7, 1931.

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Table 1.—Quantities and Values of Mineral Products from Canadian Sources 1928 and 1929

		1928			1929		
		Quantity	Value	Per cent of total	Quantity	Value	Per cent of total
METALLICS							
			\$			\$	
Arsenic (As ₂ O ₃).....	lb.	5,432,223	193,052	0.07	5,230,088	171,320	0.06
Bismuth.....	lb.	14,002	5,067		194,329	307,114	0.10
Cadmium.....	lb.	491,894	341,374	0.12	773,976	675,294	0.22
Chromite.....	tons				126	900	
Cobalt.....	lb.	956,590	1,672,320	0.61	929,415	1,801,915	0.58
Copper.....	lb.	202,696,046	28,598,249	10.40	248,120,760	43,415,251	13.97
Gold.....	fine oz.	1,890,592	39,082,005	14.21	1,928,308	39,861,663	12.82
Iron ore sold for export.....	tons	2,244	6,732		2,748	7,359	
Lead.....	lb.	337,946,688	15,553,231	5.65	326,522,566	16,544,248	5.32
Molybdenite.....	lb.				16,150	6,400	
Nickel.....	lb.	96,755,578	22,318,907	8.12	110,275,912	27,115,461	8.73
Palladium, Rhodium, Iridium, etc.....	fine oz.	13,607	627,833	0.23	17,318	809,289	0.26
Platinum.....	fine oz.	10,532	708,909	0.26	12,519	846,756	0.27
Silver.....	fine oz.	21,936,407	12,761,725	4.64	23,143,261	12,264,308	3.94
Zinc.....	lb.	184,647,374	10,143,050	3.69	197,267,087	10,626,778	3.41
Total.....			132,012,454	48.00		151,451,056	49.68
NON-METALLICS—FUELS							
Coal.....	tons	17,564,293	63,757,833	23.19	17,496,557	63,065,170	20.29
Natural gas.....	M cu. ft.	22,582,586	8,614,182	3.13	28,378,462	9,977,124	3.21
Peat.....	tons	1,497	5,845		2,607	13,339	
Petroleum, crude.....	brl.	624,184	2,035,300	0.74	1,117,368	3,731,764	1.20
Total.....			74,413,160	27.06		76,787,397	24.70
Actinolite.....	tons	70	875		30	375	
Asbestos.....	tons	273,033	11,238,360	4.09	306,055	13,172,581	4.24
Barytes.....	tons	127	2,847		105	2,341	
Beryl crystals.....	lb.				4,456	114	
Bituminous sands.....	tons	94	374		989	3,956	
Diatomite.....	tons	368	8,960		429	10,330	
Feldspar.....	tons	31,897	284,942	0.10	37,527	340,471	0.11
Fluorspar.....	tons				17,870	268,120	0.09
Graphite.....	tons	1,097	57,041	0.02	1,461	103,174	0.03
Grindstones.....	tons	1,855	100,960	0.04	1,947	106,354	0.03
Gypsum.....	tons	1,246,368	3,743,648	1.36	1,211,689	3,345,696	1.08
Iron oxides.....	tons	5,414	111,198	0.04	6,518	115,932	0.04
Magnesite.....	tons	13,195	346,990	0.13	18,809	491,170	0.16
Manganese, bog.....	tons	385	2,237		301	1,830	
Mica.....	tons	3,660	87,168	0.03	4,053	118,549	0.04
Mineral water.....	Imp. gal.	269,045	33,498	0.01	321,905	16,139	
Phosphate.....	tons	641	8,276		1,185	5,380	
Quartz.....	tons	282,522	523,933	0.19	265,949	561,527	0.18
Salt.....	tons	299,445	1,495,971	0.55	330,264	1,578,086	0.51
Silica brick.....	M	3,224	155,502	0.06	3,951	173,581	0.06
Soapstone.....	tons		40,171	0.01		47,986	0.01
Sodium carbonate.....	tons	519	4,922		600	8,100	
Sodium sulphate.....	tons	6,016	68,804	0.03	5,018	64,112	0.02
Sulphur.....	tons	38,589	321,033	0.12	42,781	350,843	0.11
Talc.....	tons	14,925	179,187	0.07	15,509	181,212	0.06
Volcanic dust.....	tons	485	9,795		300	6,000	
Total.....			18,826,692	6.85		21,073,959	6.77
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS							
Brick—Soft mud process.....	Face..... M	17,532	349,847	0.13	26,624	538,096	0.17
	Common..... M	93,280	1,328,981	0.48	77,399	1,195,511	0.39
Stiff mud process.....	Face..... M	101,717	2,247,472	0.82	114,093	2,469,417	0.80
(wire cut).....	Common..... M	144,404	2,182,307	0.79	170,840	2,509,451	0.81
Dry press.....	Face..... M	36,587	748,301	0.27	38,591	813,461	0.26
	Common..... M	24,294	337,096	0.12	26,131	368,039	0.12
Fancy or ornamental brick.....	M	599	28,763	0.01	187	12,795	
Sewer brick.....	M	2,888	59,010	0.02	4,765	96,588	0.03
Paving brick.....	M	338	4,464		97	3,844	
Firebrick.....	M	4,940	234,460	0.09	5,196	251,043	0.08
Fireclay.....	tons	5,123	35,284	0.01	5,041	35,226	0.01
Kaolin.....	tons	5	25				
Fireclay blocks and shapes.....			105,091	0.04		130,411	0.04
Hollow blocks.....	tons	205,257	1,930,152	0.70	221,800	2,214,384	0.71
Roofing tile.....	No.	72,930	6,435		35,075	4,628	
Floor tile (quarries).....	sq. ft.	171,520	45,729	0.02	307,400	70,186	0.02
Drain tile.....	M	22,629	656,054	0.24	25,000	720,316	0.23
Sewer pipe, copings, flue linings, etc.....	tons		1,723,644	0.63		2,005,887	0.65
Pottery, glazed or unglazed.....			356,093	0.13		323,194	0.10
Bentonite.....	tons	20	100				
Other clay products.....			2,410			142,166	0.05
Total.....			12,381,718	4.50		13,904,643	4.47
Cement.....	brl.	11,023,928	16,739,163	6.10	12,284,081	19,337,235	6.23
Lime.....	tons	508,889	4,534,568	1.65	674,087	5,908,610	1.90
Sand and gravel.....	tons	28,102,917	5,809,431	2.11	27,846,945	7,317,814	2.36
STONE							
Granite.....	tons	1,195,810	2,366,946	0.86	1,728,165	3,080,815	0.99
Limestone.....	tons	6,949,420	7,267,437	2.64	7,720,840	8,172,681	2.63
Marble.....	tons	7,753	414,682	0.15	14,012	414,062	0.14
Sandstone.....	tons	100,951	223,236	0.08	154,407	398,974	0.13
Total.....			37,355,463	13.59		44,630,191	14.38
Grand total.....			274,989,487	100.00		310,850,246	100.00

7

		Increase (+) or Decrease (-)		Increase (+) or Decrease (-)	
		Quantity	per cent	Value	per cent
METALLICS					
Arsenic.....	lb.	- 202,135	- 3.7	\$ 21,732	- 11.2
Bismuth.....	lb.	+ 180,327	+	302,047	+
Cadmium.....	lb.	+ 282,082	+ 57.3	333,920	+ 97.8
Chromite.....	tons	+ 126	+	900	+
Cobalt.....	lb.	+ 27,175	+ 2.8	129,595	+ 7.7
Copper.....	lb.	+ 45,424,714	+ 22.4	14,817,002	+ 51.8
Gold.....	fine oz.	+ 37,716	+ 1.9	779,658	+ 1.9
Iron ore sold for export.....	tons	+ 504	+ 22.4	627	+ 9.3
Lead.....	lb.	+ 11,424,122	+ 3.4	991,017	+ 6
Molybdenite.....	lb.	+ 16,150	+	6,400	+
Nickel.....	lb.	+ 13,520,334	+ 13.9	4,796,554	+ 21.6
Palladium, Rhodium, Iridium, etc.....	fine oz.	+ 3,711	+ 27.3	181,456	+ 28.9
Platinum.....	fine oz.	+ 1,987	+ 18.9	137,847	+ 4.6
Silver.....	fine oz.	+ 1,206,854	+ 5.5	497,417	+ 3.9
Zinc.....	lb.	+ 12,619,713	+ 6.8	483,728	+ 4.8
Total.....				+22,441,602	+ 17.0
NON-METALLICS					
Coal.....	tons	- 67,736	- 0.4	692,663	- 1.1
Natural gas.....	M cu. ft.	+ 5,795,876	+ 25.7	1,362,942	+ 15.8
Peat.....	tons	+ 1,110	+ 74.2	7,494	+ 128.2
Petroleum.....	brl.	+ 493,184	+ 79.0	1,696,464	+ 83.4
Total.....				+ 2,374,237	+ 3.2
Actinolite.....	tons	+ 40	+ 57.1	500	+ 57.2
Asbestos.....	tons	+ 33,022	+ 12.1	1,934,221	+ 17.2
Barytes.....	tons	+ 22	+ 17.3	506	+ 17.8
Beryl crystals.....	lb.	+ 4,456	+	114	+
Bituminous sands.....	tons	+ 895	+	3,582	+
Diatomite.....	tons	+ 61	+ 16.6	1,370	+ 15.3
Feldspar.....	tons	+ 5,630	+ 17.6	55,529	+ 19.5
Fluorspar.....	tons	+ 17,870	+	268,120	+
Graphite.....	tons	+ 364	+ 33.2	46,133	+ 80.9
Grindstones.....	tons	+ 92	+ 4.9	5,394	+ 5.3
Gypsum.....	tons	+ 34,679	+ 2.8	397,952	+ 10.6
Iron oxides.....	tons	+ 1,104	+ 20.4	4,734	+ 4.2
Magnesite.....	tons	+ 5,614	+ 42.5	144,180	+ 41.5
Manganese, bog.....	tons	+ 84	+ 21.8	407	+ 18.2
Mica.....	tons	+ 393	+ 10.7	31,381	+ 36.0
Mineral water.....	Imp. gal.	+ 52,860	+ 19.6	17,359	+ 51.8
Phosphate.....	tons	+ 544	+ 84.8	2,896	+ 34.9
Sulphur.....	tons	+ 4,192	+ 10.8	29,810	+ 9.3
Quartz.....	tons	+ 16,573	+ 5.8	37,594	+ 7.2
Salt.....	tons	+ 30,819	+ 10.3	82,115	+ 5.5
Silica brick.....	M	+ 727	+ 22.5	18,079	+ 11.6
Soapstone.....				7,815	+
Sodium carbonate.....	tons	+ 81	+ 15.6	3,178	+ 64.5
Sodium sulphate.....	tons	+ 998	+ 16.6	4,692	+ 6.8
Talc.....	tons	+ 584	+ 3.9	2,025	+ 1.1
Volcanic dust.....	tons	+ 185	+ 38.1	3,795	+ 38.7
Total.....				+ 2,247,267	+ 11.9
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS					
Brick—Soft mud process—(Face.....	M	+ 9,092	+ 41.8	188,249	+ 53.8
Common.....	M	+ 15,881	+ 17.0	133,470	+ 1.0
Stiff mud process (wire cut)—(Face.....	M	+ 12,376	+ 12.2	221,945	+ 9.9
Common.....	M	+ 26,436	+ 18.3	327,144	+ 15.0
Dry press—Face.....	M	+ 2,004	+ 5.5	65,160	+ 8.7
Common.....	M	+ 1,837	+ 7.5	30,943	+ 9.2
Fancy or ornamental brick.....	M	+ 412	+ 68.8	15,968	+ 55.5
Sewer brick.....	M	+ 1,877	+ 65.0	37,578	+ 63.7
Paving brick.....	M	+ 241	+ 71.3	620	+ 13.9
Firebrick.....	M	+ 256	+ 5.2	16,583</	

Grand total

Table 3.—Mineral Production of Canada, by Provinces, 1929

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
METALLICS									
Arsenic.....lb.				3,742,913				1,487,175	
\$				154,887				16,433	
Bismuth.....lb.				27,446				166,883	
\$				23,413				283,701	
Cadmium.....lb.								773,976	
\$								675,294	
Chromite.....tons								126	
\$								900	
Colbalt.....lb.				929,415					
\$				1,801,915					
Copper.....lb.			55,337,169	88,879,853				103,903,738	
\$			10,019,901	14,622,572				18,772,778	
Gold.....fine oz.	2,687		90,798	1,622,267	22,455		5	154,204	35,892
\$	55,545		1,876,961	33,535,234	464,186		103	3,187,680	741,954
Iron ore sold for ex-tons			2,748						
port. \$			7,359						
Lead.....lb.			5,358,304	4,769,506				307,999,153	8,395,603
\$			270,616	294,431				15,555,189	424,012
Molybdenite.....lb.			16,150						
\$			6,400						
Nickel.....lb.				110,275,912					
\$				27,115,461					
Palladium, Rhodium, etc.*.....fine oz.				17,141				177	
\$				802,453				6,836	
Platinum*.....fine oz.				12,474				45	
\$				843,928				2,828	
Silver.....fine oz.	132		813,821	8,890,726	2,644			10,156,408	3,279,530
\$	70		431,268	4,711,462	1,401			5,382,185	1,737,922
Zinc.....lb.			19,653,440	5,516,806				172,096,841	
\$			1,058,731	297,190				9,270,857	
Totals.....\$	55,615		13,671,236	84,202,946	465,587		103	53,154,681	2,903,888
NON-METALLICS FUELS									
Coal.....tons	7,056,133	218,706				570,189	7,150,693	2,490,378	458
\$	28,071,956	909,169				993,226	22,928,182	10,160,789	1,848
Natural gas....M cu. ft.		678,456		8,586,475	600		19,112,931		
\$		333,002		4,959,695	180		4,684,247		
Peat.....tons			1,607	1,000					
\$			8,839	4,500					
Petroleum, crude...bbl.		7,499		121,194			988,675		
\$		19,909		253,678			3,458,177		
Total.....\$	28,071,956	1,262,080	8,839	5,217,873	180	993,226	31,070,606	10,160,789	1,848
Other Non-Metallics									
Actinolite.....tons				30					
\$				375					
Asbestos.....tons			306,055						
\$			13,172,581						
Barytes.....tons	105								
\$	2,341								
Beryl crystals.....lb.				4,456					
\$				114					
Bituminous sands...tons							989		
\$							3,950		
Diatomite.....tons	254							175	
\$	5,080							5,250	
Feldspar.....tons			15,790	21,737					
\$			133,492	206,979					
Fluorspar.....tons				70				17,800	
\$				1,120				267,000	
Graphite.....tons			173	1,288					
\$			12,652	90,522					
Grindstones.....tons	6	1,731						210	
\$	110	103,514						2,730	
Gypsum.....tons	948,895	70,482		100,347	67,269			24,696	
\$	1,152,160	485,982		832,689	631,051			243,814	
Iron oxides.....tons			6,220					298	
\$			113,932					2,000	
Magnesite.....tons			18,809						
\$			491,170						
Manganese, bog....tons		300						1	
\$		1,800						30	
Mica.....tons			1,062	2,991					
\$			72,630	45,919					
Mineral water. Imp. gal.			12,205	309,700					
\$			2,488	13,651					
Phosphate.....tons			40					1,145	
\$			800					4,580	
Pyrites (see Sulphur)									
Quartz.....tons	11,845		46,444	187,973	10,045			9,642	
\$	31,388		132,532	316,050	35,610			45,947	
Salt.....tons	27,819			302,445					
\$	157,662			1,420,424					
Silica brick.....M	2,385			1,566					
\$	93,207			80,374					

Table 3.—Mineral Production of Canada, by Provinces, 1929—Concluded

	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
Soapstone..... tons									
Sodium carbonate.. tons			47,986					600	
\$								8,100	
Sodium sulphate... tons						5,018			
\$						64,112			
Sulphur..... tons			9,926	4,579				28,276	
\$			73,119	51,516				226,208	
Talc..... tons				15,463				46	
\$				180,492				720	
Volcanic dust..... tons						300			
\$						6,000			
Total..... \$	1,441,948	591,296	14,253,382	3,240,225	666,661	70,112	3,956	806,379	
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS									
Brick—									
Soft mud process—									
Face..... M	185	60	1,000	25,379					
\$	2,406	1,500	12,000	522,191					
Common..... M	757	3,471	7,468	33,054	14,409	473	3,390	9,376	
\$	10,020	55,120	76,963	606,714	234,481	7,031	45,932	159,250	
Stiff mud process (wire cut)—									
Face..... M	1,651	432	38,146	63,570	3,040	2,071	2,281	2,903	
\$	44,654	10,808	771,573	1,333,723	70,940	62,790	67,166	107,763	
Common..... M	12,818	2,124	99,818	31,524		10,573	13,866	86	
\$	160,906	31,860	1,529,751	505,958		121,833	157,250	1,893	
Dry press—									
Face..... M			2,990	30,291		1,184	4,125		
\$			81,333	611,625		38,652	81,851		
Common..... M				5,482			18,322	2,327	
\$				76,016			254,472	37,551	
Fancy or ornamental brick.... M			75	111					
\$			3,783	9,012					
Sewer brick..... M				4,631				134	
\$				92,316				4,272	
Paving brick..... M								97	
\$								3,844	
Firebrick..... M	154					809	59	4,175	
\$	11,340					43,384	2,934	193,385	
Fireclay..... tons	2,972	47				754	48	1,220	
\$	10,669	1,863				5,965	624	16,105	
Kaolin..... tons									
\$									
Bentonite..... tons									
\$									
Fireclay blocks and shapes..... \$	675	1,351				106,643		21,742	
Hollow blocks..... tons	15,455	1,119	49,488	103,454	2,785	13,257	20,812	15,430	
\$	182,076	23,734	536,684	972,993	41,254	111,072	195,503	151,068	
Roofing tile..... No.				35,075					
\$				4,628					
Floor tiles (quarries) sq. ft.				307,400					
\$				70,186					
Drain tile..... M	131		807	22,535	392	25	158	952	
\$	5,284		28,500	629,322	15,565	1,000	7,711	32,934	
Sewer pipe, copings, flue linings, etc.... \$	225,128		147,115	1,167,463			335,954	130,227	
Pottery, glazed or unglazed..... \$		33,770		96,394			193,030		
Other clay products \$				131,621		4,152		6,393	
Total..... \$	653,157	160,006	3,187,702	6,830,162	362,240	502,522	1,342,427	866,427	
Cement..... brl.			5,169,408	4,624,712	1,000,258		808,796	680,907	
\$			7,120,374	6,608,246	2,350,606		1,770,786	1,487,223	
Lime..... tons	42,001	15,518	166,892	370,158	32,246		7,681	39,591	
\$	154,187	174,553	1,264,194	3,364,411	361,104		79,569	510,592	
Sand and gravel..... tons	332,599	525,857	6,203,231	11,358,568	1,782,085	3,496,679	1,721,930	2,425,996	
\$	151,368	46,167	1,534,699	3,462,379	322,430	687,646	447,993	665,132	
Stone..... tons	264,706	27,352	3,484,471	5,239,672	192,109		5,183	408,931	
\$	376,222	204,970	5,317,859	4,736,263	895,017		24,546	511,655	
Total..... \$	681,777	425,690	15,237,126	18,171,299	3,929,157	687,646	2,322,894	3,174,602	
Grand total..... \$	30,904,453	2,439,072	46,358,285	117,662,505	5,423,825	2,253,506	34,739,986	68,162,878	2,905,736

*NOTE.—The 1929 production of platinum metals from Ontario ores included in the above table represents the actual recoveries of refined metals during 1929, from both the Mond and International groups of mines. Heretofore, the Mond Company reported (estimated) precious and rare metals recoverable from concentrates, etc., as determined by assay, while the International company reported actual metal recoveries. In consequence the Mond recoveries for 1929 include a substantial portion of its 1928 metals estimated as recoverable but not actually refined, and so involving certain duplication. Hereafter only figures of actual recoveries by the amalgamated companies will be reported and included in the total mineral output of the Province, and overlapping will thereby be avoided. This note also refers to table 129 on page 115.

†Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

DOMINION BUREAU OF STATISTICS.

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W. H. LOSEE, B.Sc., Chief of the Mining, Metallurgical and Chemical Branch.

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR 1929

CHAPTER ONE

GENERAL REVIEW.—Continued expansion and efficient development in the Canadian mining industry resulted in the establishment in 1929 of a new high record mineral production of \$310,850,246. This total is greater than that for 1928 by \$35,860,759 or 13 per cent, and represents a value of \$31.72 per capita. In a survey of the major mineral groups, we find appreciable and general production increases over those of the previous year. Metals retain a position of paramount importance showing a total production of \$154,454,056 and a gain of 17 per cent over 1928. Fuels, including coal, peat, natural gas and petroleum, attained a combined value of \$76,787,397, an increase of 3 per cent; the other important division of the non-metallics, represented largely by the silicates and various rock forming minerals registered an output valuation of \$21,073,959, or 12 per cent more than in 1928; clay products were appraised at \$13,904,643 surpassing 1928 by 12 per cent; cement and other structural materials valued at \$44,630,191 were 19 per cent higher than last year.

Capital employed in the mining industry of Canada during 1929 amounted to \$867,021,033; this wealth, in addition to supplying operating funds for active companies, was utilized in equipping and developing the metallurgical plants and mines of the nation.

This great industry, with its varied and multitudinous activities, supports 95,102 employees in the operation of mines, oil fields, smelters, cement mills and other associated spheres of production; salaries and wages amounted to \$124,490,511.

Early history of Canadian mining, gleaned from records of the period of the French regime is closely interwoven with that of the first navigators and explorers to reach our shores. In 1604 discoveries in Nova Scotia of iron and silver were made in St. Marys Bay and later copper was found at Cape d'Or. These minerals were located by Master Simon, a mining engineer in the employ of the celebrated explorer Champlain. A natural history of Acadia, written by Nicolas Denys and published in Paris in 1672 mentions the discovery of coal in Nova Scotia and is the first reference to the occurrence of this mineral in North America; metallurgical operations involving the smelting of bog and other iron ores were carried out on the St. Maurice river and other points along the north shore of the St. Lawrence as early as the year 1730. Other mineral

discoveries followed closely the water routes of both the early French and British explorers; argentiferous galena was found on the shores of Lake Temiskaming at a location within earshot of blasting operations that, some two hundred years later, revealed to the world the silver deposits of the now famous Cobalt camp.

In the far west coal was found at Fort Rupert in 1835, and placer gold was discovered in 1858 along the Fraser and other rivers in British Columbia; these early events in the mining history of this province were forerunners to the more important development of large copper and silver-lead-zinc ore bodies, a development made possible only through the construction of the transcontinental railroads.

Almost coincident with these western discoveries were the efforts of the eastern provinces to establish mining and metallurgical industries capable of supplying the metal requirements of a growing country. During the period from 1843-1870 iron and copper ores were produced in Ontario and Quebec; iron furnaces were operated in the latter province at Three Rivers, Radnor Forges and at Drummondville, the metal recovery coming chiefly from bog ores with charcoal being employed as a fuel. Placer gold deposits of the Beauce district in the basin of the Chaudiere river of Quebec have been known since 1823, and produced up to 1912, gold estimated at between two and one half and three million dollars. In Nova Scotia the production of lode gold from 1862 to 1929 amounted to 922,936 fine ounces.

Railroad construction in Ontario during the years 1883 and 1903 was directly responsible for the discovery of the nickel and silver ores of the Sudbury and Cobalt mining camps. The importance of these ore bodies to the industrial life of Canada is especially emphasized in 1929 by the magnitude of the expansion programme in the mining and metallurgical operations of the International Nickel Company at Sudbury.

Mineral production in the Dominion amounted to \$10,000,000 or about \$2.23 per capita in 1886. Later and following the sensational placer gold discoveries in the Yukon, production mounted to \$66,000,000 or \$12.16 per capita. A steady increase in the value of mineral production is recorded from 1904 to 1918, some annual declines were experienced during the post war depression period, this condition was, however, only transitory and with the increasing flow of wealth, largely from the mines of Rouyn, Thetford, Porcupine, Kirkland lake, Sudbury, Trail, and the Pacific coast, Canada has attained a position of prominence in the mining industry of the world, a position which in 1929 places her first in asbestos and nickel, third in production of gold and silver, fourth in lead and copper, sixth in zinc and eleventh in the output of pig iron and coal.

METALLICS.—Metallic mineral production totalled \$154,454,056 in 1929 realizing a gain of 17 per cent over 1928.

Arsenic production amounted to 5,230,088 pounds valued at \$171,320; this included both white arsenic and arsenic contained in exported concentrates. This output was 202,135 pounds less than in 1928. All the white arsenic manufactured in Canada comes from the Deloro Smelting and Refining Co., Ltd., Deloro, Ont.

Bismuth production in 1929 was very much higher than that of the previous year, amounting to 194,329 pounds worth \$307,114. Metallic bismuth was made in 1929 by the Consolidated Mining and Smelting Co., Ltd., Trail, B.C., and by the Deloro Smelting and Refining Co., Ltd., Deloro, Ont.; it is also recovered by foreign refineries from the lead-silver bullion shipped by the latter company.

Cadmium consumption, especially in the electroplating industries, is increasing very rapidly. This metal was produced commercially in Canada for the first time in 1928. The Canadian production in 1929 represented a by-product in the electrolytic refining of zinc by the Consolidated Smelting and Refining Co. at Trail, B.C.,

Cobalt at 929,415 pounds and a valuation of \$1,801,915, showed a decrease of 27,175 pounds from the 1928 production. This loss was more than compensated by an increase in value of 7.7 per cent; decreasing silver prices were largely responsible for the curtailed Canadian production of 1929.

Copper from the various producers of this metal in Canada amounted to 248,120,760 pounds, a substantial increase over the 1928 production of 202,696,046 pounds. Quebec registered an increase of 21,638,000 pounds, due largely to the increased output from Noranda; in Ontario an enlarged production amounting to 22,000,000 pounds came principally from the expanding copper-nickel industry at Sudbury, while in British Columbia the previous year's record was exceeded by 16,000,000 pounds. Copper on the New York market reached an average price of \$0.18 per pound, this is the highest value recorded since 1919.

Production of gold during 1929, from all sources in Canada, amounted to 1,928,308 fine ounces valued at \$39,861,663, as against an output of 1,890,592 fine ounces valued at \$39,082,005 in 1928. This was the largest output ever recorded.

The total 1929 output was recovered from the following sources: fine gold contained in crude bullion made by gold mines, 1,673,797 fine ounces; alluvial gold, 40,837 fine ounces; fine gold in blister copper and base bullion made at Canadian smelters from Canadian ores, 96,718 fine ounces; the estimated recovery of gold in ores, matte and concentrates exported to foreign smelters, 113,452 fine ounces; and 3,504 fine ounces from miscellaneous sources.

Six provinces and the Yukon produced gold as follows: Nova Scotia, 2,687 fine ounces; Quebec, 90,798 fine ounces; Ontario, 1,622,267 fine ounces; Manitoba 22,455 fine ounces; Alberta, 5 fine ounces; British Columbia, 154,204 fine ounces; Yukon, 35,892 fine ounces. Gold from Nova Scotia was produced in the form of crude bullion and was shipped to the Royal Mint at Ottawa for refining. The greater part of the Quebec output was contained in blister copper made at the Noranda smelter; the remainder was made up from the gold contained in concentrates shipped from the Tetreault silver-lead-zinc property and from auriferous quartz mining in the northwest part of the province.

In Ontario the Porcupine area contributed 932,732 fine ounces; Kirland lake produced 679,504 fine ounces; Sudbury district copper-nickel ores yielded 7,802 fine ounces, and 2,229 fine ounces were recovered from miscellaneous sources.

Gold held third place in point of value among Canada's mineral products in 1929 being surpassed only by coal and copper; the value of gold represented 12.8 per cent of the total mineral production of the Dominion in 1929. As a world producer of gold Canada ranked third; South Africa was first with a production in 1929 of 10,412,326 fine ounces and United States, second with an output of 2,056,629 fine ounces.

Lead in 1929 was less than the 1928 production by 11,424,122 pounds. The value however, of \$16,544,248 for this output was 6.3 per cent above that of the previous year and resulted from enhanced prices for the metal. The greater quantity of exported lead goes in the order of its value to Great Britain, Japan, Germany and Belgium; lesser quantities are shipped to various other countries in Europe and the Orient. Metal from the Trail plant of the Consolidated Mining and Smelting Company, Ltd., continues to constitute the greater part of the annual lead production of Canada.

Nickel from the mines of the Sudbury areas and to a small extent from the Cobalt field amounted to 110,275,912 pounds in 1929. This production is a 13.9 per cent increase over that of 1928 and created a new and outstanding high record in nickel mining. This metal output with the impressive value of \$27,115,461 emphasizes the rapidly increasing demand and importance of nickel in the industrial world of today. Falconbridge Nickel Mines, Ltd., a new company in the Sudbury field, was active in both mining and metallurgical developments, and the company expects to reach production early in 1930. A general expansion in the nickel

industry has resulted largely from the merger last year of the two older producing organizations into the International Nickel Company of 1929, this new corporation is endowed with the necessary mineral wealth, financial resources, and production equipment to supply the nickel markets of the world.

A silver recovery of 23,143,261 fine ounces from the various Canadian metal mining industries was 5.5 per cent in advance of 1928. There was, unfortunately, a decline in value of \$497,417, which loss was due to the almost steady fall in silver prices during recent years. British Columbia, with a production of 10,156,408 fine ounces continues as the leading silver mining province. This output comes largely through the Trail metallurgical plants, from the ores of the immense silver-lead-zinc deposit at the Sullivan mine. Other important silver contributors in the west are the silver-lead mines of the Portland Canal section of British Columbia and the Mayo district of the Yukon. The combined production from British Columbia and the Yukon constitute 58 per cent of the Canadian total. In the eastern provinces, 8,890,726 fine ounces of silver were obtained from the arsenical and cobaltiferous ores of Gowganda, South Lorraine, and Cobalt camps in northern Ontario; while in Quebec 813,821 fine ounces were produced from the lead-zinc ores and the copper-gold ores of the province. Minor quantities of the metal are recovered in the refining of gold bullion from the gold mines in Nova Scotia and Manitoba.

Zinc production in 1929 was higher in both quantity and value than in any previous year in the history of Canadian mining. The output of 197,267,087 pounds was 6.8 per cent greater than in 1928 and the increase in value over the previous year amounts to \$483,728. Refined zinc was made at the Trail plant of the Consolidated Mining and Smelting Co., Ltd, and zinc concentrates were shipped to Belgium, from mines at Bradley, Ontario, and Notre Dame des Anges, Quebec. Exploration and mining development on the large copper-zinc deposits of north-western Manitoba, together with the already proven tonnage of these ores in other sections of the country indicate, in Canada, a potential zinc supply of considerable magnitude.

FUELS AND OTHER NON-METALICS.—This division of Canadian mineral production, including among its more important items—coal, natural gas, petroleum, asbestos, gypsum and salt, realized in 1929 a valuation of \$97,861,356, an increase of 4.9 per cent over that for the preceding year.

Coal, the principal Canadian mineral product, showed for 1929 a production decrease of 67,736 tons or 0.4 per cent lower than in 1928. The 1929 output was, however, higher than the average for the last five years. In the provinces, Nova Scotia registered an increase of 4.6 per cent; New Brunswick, 5.3 per cent; and Saskatchewan, 23.0 per cent; the national decrease resulted from lessened productions in Alberta and British Columbia. Nova Scotia, New Brunswick, British Columbia and the Yukon mined bituminous coal only; Saskatchewan production is confined to lignites; and Alberta produces bituminous, sub-bituminous, and lignite. Exports of Canadian coal in 1929 amounted to 842,972 tons, a decrease of 2.43 per cent from the 1928 total of 863,941 tons. The United States and Newfoundland afforded the principal foreign markets for Canadian coal; importation of Russian anthracite in 1929 amounted to 117,304 tons. Combined imports of anthracite, bituminous and lignite coal into Canada were 18,619,300 tons as against 17,714,296 tons in 1928. Receipts from Great Britain during the year were 25.98 per cent in excess of the 670,612 tons imported in 1928. The United States shipped into Canada 14,469,831 tons of bituminous, 3,173,043 tons of anthracite, and 14,108 tons of lignite. During 1929 lignite deposits, situated on the Mattagami river in northern Ontario, were investigated by the Ontario Bureau of Mines and considerable development work was done during the year.

Natural gas production from fields in New Brunswick, Ontario, Manitoba and Alberta was 28,378,462 thousand cubic feet valued at \$9,977,124, a new high record in the industry, and a gain of 25.7 per cent in quantity and 15.8 per cent in value over the production in 1928. Alberta, with an output of 19,112,931 thousand cubic feet contributes 67.3 per cent of the Canadian total. Natural gas consumed for domestic purposes amounted to approximately 16,000,000 thousand cubic feet and the consumption by the various industries came to 12,000,000 thousand cubic feet.

Crude petroleum from wells in New Brunswick, Ontario and Alberta established in 1929 a new high and impressive record in the oil producing industry of Canada. The various fields produced 1,117,368 barrels valued at \$3,731,764. This output exceeded the total of 1928 by 79 per cent in quantity and 83 per cent in value. This striking increase was largely possible through the successful development of the Turner Valley field in Alberta. Drilling was quite active throughout the year in southern Alberta and considerable geological study was given the foothill structures of this same province.

Asbestos production in Canada instituted a new high record in 1929; shipments amounted to 306,055 tons valued at \$13,172,581, an increase of 12.1 per cent in quantity and 17.2 per cent in value as compared with the production of the previous year. The average value received by the operators was \$43.04 per ton. Canada's exports of asbestos, including sand and waste, reached a grand total of 292,030 tons in 1929. This was made up of 5,843 tons to Great Britain, 232,464 tons to the United States, 14,942 tons to Belgium, 13,996 tons to Germany, 10,698 tons to Japan, and smaller tonnages to several other countries.

Gypsum coming from Canadian quarries and mines in Nova Scotia, New Brunswick, Ontario, Manitoba and British Columbia amounted to 1,211,689 tons during 1929, and was valued at \$3,345,696. These figures reveal both volume and value decreases as compared with those of 1928. Nova Scotia contributing 78.2 per cent of the national total continues to occupy a premier position in Canadian gypsum mining; approximately 92 per cent of the production from this province was shipped in crude form to the United States. Ground gypsum and prepared wall plaster exported during 1929 totalled 7,938 tons and consisted principally of shipments to United States, Newfoundland, Australia and New Zealand. Exports of crude gypsum amounted to 893,445 tons, all of which was imported by the United States.

Salt production in Canada reached a new high level during 1929, the output of 330,264 tons was valued at \$1,578,086. These figures represent increases of 10.3 per cent in quantity and 5.5 per cent in value over 1928. Ontario contributed 91.6 per cent of the 1929 output, and in Nova Scotia the Malagash mine production was 42 per cent higher than 1928. Shipments during the year, exclusive of the salt content of brine used in the manufacture of chemicals, averaged \$8.70 per ton.

Non-metallics include several other quite important minerals. This group is represented largely by various silicates and other rock-forming minerals. Shipments of Canadian feldspar during 1929 increased 17.6 per cent in quantity and 19.5 per cent in value over the totals for 1928; the 1929 tonnage amounted to 37,527 tons valued at \$340,471; mica production was greater in both volume and value than in 1928; increases were recorded in the output of iron oxides, magnesite, diatomite, talc and grindstones; other non-metallic minerals produced were quartz, pyrites, sodium sulphate, soapstone, phosphate, bog manganese, graphite, beryl crystals, fluor-spar, volcanic dust, actinolite and barytes.

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS.—Continued expansion in Canadian construction throughout 1929 was strongly reflected in an almost general increase in the production of building materials. Total sales of clay, and clay products produced from domestic clays, and the value added by manufacturing in the branch of this industry using imported clays, were valued at \$16,285,531, the value of clay and clay products sold by Canadian producers during 1929 advanced 13.6 per cent over the preceding year. Cement production in Canada set up a new high record with an output of 12,284,081 barrels valued at \$19,337,235; mills in Quebec produced 42.1 per cent of the total Canadian shipments; in Ontario, 37.7 per cent; in Manitoba, 8.1 per cent; in Alberta, 6.6 per cent; and in British Columbia, 5.5 per cent. Sand and gravel production in 1929 amounted to 27,846,945 tons valued at \$7,317,814 at compared with 28,102,917 tons at \$5,809,431 in 1928. A lime output of 674,087 tons valued at \$5,908,610 exceeded in both tonnage and value the production of 1928. Stone production during the year was valued at \$17,501,658, which included the value of the quarry output and the value added by manufacturing in the secondary stone industry; shipments of stone from Canadian quarries during 1929 amounted to 9,622,424 tons valued at \$12,066,532.

THE PROVINCES

NOVA SCOTIA.—Nova Scotia, with an output valued at \$30,904,453, stands fifth among the mineral producing provinces of Canada. This province leads in the Dominion production of barytes, diatomite, gypsum, silica brick and fireclay. Coal is the most important item in the mineral production of Nova Scotia and in 1929 amounted to 7,056,133 tons with a value of \$28,071,956.

NEW-BRUNSWICK.—New Brunswick, in 1929, yielded mineral wealth amounting to \$2,439,072 or 0.79 per cent of the Canadian total; this province is essentially a producer of the non-metallics and during the year shipped or produced coal, natural gas, crude petroleum, grindstones, gypsum, bog manganese, clay products and other structural materials. Considerable interest was recently taken in the exploration of copper and nickel deposits situated in the coastal zone.

QUEBEC.—Quebec has, during the past few years, attained a position of prominence among the mining provinces of Canada. In 1929, the province produced mineral wealth to the value of \$46,358,285. This valuation constitutes a new high record for Quebec and retains for her the distinction of being the third most important mineral producing province in Canada. The non-metallic mineral production, largely comprised of asbestos, has, for years, been much greater than the output from the metal mines. This difference, however, has been greatly reduced recently by an increased production in copper, gold, lead and zinc. Production gains in 1929 were made in copper, gold, asbestos, feldspar, graphite, iron oxides, magnesite, mica, sulphur, clay products and other structural materials. Production of lead, zinc and silver was less than the previous year.

ONTARIO.—Ontario, with a wide variety of economic ore deposits, especially those of the mining camps of Sudbury, Porcupine and Kirkland lake, is endowed with an abundance of potential mineral resources; resources whose intense development during the past few years is reflected by the general prosperity of the mining industry in 1929. Substantial gains were recorded in all of the principal mineral outputs and production valued at \$117,662,505, created a new high record for the province. This amount is 37.8 per cent of the grand total for Canada, and establishes Ontario as the premier mineral producing province in the Dominion. The valuation by groups gives metallics, \$84,202,946; fuels, \$5,217,873; other non-metallics, \$3,240,225, and clay products, \$6,830,162. Production of cement, stone, lime, sand and gravel amounted to \$18,171,299 which represents, for these products, an increase of 27.5 per cent over that for 1928.

MANITOBA.—Manitoba's mines and associated mineral industries yielded, in 1929, mineral wealth valued at \$5,423,825. Gold production amounted to \$464,186 and was the most important item in the metal group; mineral fuel production was practically negligible and other non-metallics, chief of which was gypsum, totalled \$631,051. The various clay products and other structural materials, including the output from cement works, lime plants, stone quarries, sand pits, and gravel operations, totalled \$4,291,397. Mineral production in Manitoba during 1929 showed substantial increases in all the main divisions of the industry and realized a gain of 29.5 per cent over the output of 1928. Construction on important metallurgical plants and development of ore reserves at the Flin Flon and Sherritt-Gordon mines, in the northwest part of the province, have progressed rapidly throughout the year and indicate that Manitoba will become one of the copper-zinc producing provinces in 1930.

SASKATCHEWAN.—Saskatchewan produces no metalliferous ores; the mineral production of this province comes almost entirely from the coal, clay, and structural material industries. In 1929 the value of coal produced was \$993,226, this being an increase of \$161,735 above that of 1928. The total value of the mineral production for the year amounted to \$2,253,506 representing an increase of 31 per cent over the previous year. Sodium sulphate and volcanic ash shipments were valued at \$70,112; sand and gravel production totalled \$687,646 and the output of various clays and clay products possessed a value of \$502,522.

ALBERTA.—Alberta, in 1929, was the leading fuel producing province in Canada. The total value of coal, natural gas and petroleum was \$31,070,606 as compared with \$29,051,052 in 1928. Oil and gas wells, especially in the southern sections of the province, are important contributors to the annual mineral production of Alberta. Geological investigation and technical research on the bituminous sands of the Athabaska section suggest the possibility of these large deposits becoming of early economic importance; 989 tons of this material were shipped during the year. The total mineral production for 1929 realized a value of \$34,739,986, an increase of 6.8 per cent over that of the preceding year.

BRITISH COLUMBIA.—British Columbia, second in importance among the mineral producing provinces of Canada, produced in 1929 mineral wealth to the value of \$68,162,878. This is a new high record for this province and shows an increase of 5.7 per cent over the value for 1928. Of the combined Canadian mineral yield, British Columbia contributed 41 per cent of the copper; 43 per cent of the silver; 8 per cent of the gold; 94 per cent of the lead and 87 per cent of the zinc. Included in the wide variety of metals and minerals produced in British Columbia are: arsenic, bismuth, cadmium, chromite, fluorspar, gypsum, iron oxides, phosphate, pyrites, quartz and sodium carbonate. Coal is mined on Vancouver Island, along the Crowsnest Pass and in different parts of the interior. Clay products and structural materials including cement, lime, stone, sand and gravel were valued at \$4,041,029. In the Trail plants of the Consolidated Mining and Smelting Company, Canada possesses one of the largest and most efficient metallurgical institutions of the world; a superphosphate unit, now under construction, is one of the more recent additions to this great industrial development.

YUKON.—Yukon mineral production in 1929 was confined to gold, lead, silver and coal; this output valued at \$2,905,736 was \$195,779 more than in the previous year. Gold was recovered from alluvial deposits and the silver-lead production resulted from smelter treatment of concentrates shipped by mines in the Mayo district. This territory contains 2,840 square miles of coal lands with an estimated probable reserve of 250,000,000 tons of bituminous and 4,690,000,000 tons of lignite coal.

NORTHWEST TERRITORIES.—Franklin, Keewatin and Mackenzie, constituting the Northwest Territories of Canada, and exclusive of Hudson and Ungava bays, comprise an area of 1,309,682 square miles, or greater than that of British India.

Mineral wealth, although little developed, is known to exist in several sections; wells drilled in the vicinity of Fort Norman on the lower Mackenzie, are stated to have proven this area to be a potential oil field of the future. Large deposits of lead-zinc ores occurring at Great Slave lake were actively explored during the field season of 1929. Prospecting and investigations of a preliminary nature were carried out on the chalcocite, bornite, and native copper occurrences south of Coronation Gulf, and in the eastern districts systematic exploration centred around the Chesterfield inlet and Baker lake areas. The large hematite deposits of the Belcher islands were re-examined as to their possible economic importance and it is suggested that the opening of Fort Churchill as an ocean port may be a deciding factor in the future development of these iron ores.

Exploration and prospecting were greatly stimulated and advanced in the Territories by the adoption of aerial transportation. The efficiency of this mode of travel is especially emphasized in the enormous amount of reconnaissance accomplished as in contrast with the slower and laborious methods by canoe and pack trail.

INDUSTRIAL REVIEW.—The capital employed in Canadian mines in 1929 amounted to \$867,021,033 of which \$427,498,173 was invested in metal mining and metallurgical works; \$264,885,834 in coal mines and oil and gas wells; \$52,416,662 in other non-metal mining enterprises such as asbestos, feldspar, graphite, etc.; \$34,190,056 in the clay products industry; and \$88,030,308 in properties producing cement, lime, sand and gravel and stone.

Investments in coal mining and in gold quartz mining and milling each accounted for 16 per cent of the total capital employed in the mining industry; metallurgical works represented another 17 per cent; natural gas, 8 per cent; nickel-copper mining, 2 per cent; cement manufacture, 6 per cent; clay products about 4 per cent, and stone quarrying, 2 per cent. Ontario mines accounted for 35 per cent of the total investment in the industry. For the other provinces, the relative capital investments in mining expressed in percentages of the total for Canada were as follows: British Columbia, 19 per cent; Quebec, 16 per cent; Alberta, 16 per cent; Nova Scotia, 8 per cent; Manitoba, 2 per cent; the remaining 2 per cent represented the investment in the provinces of New Brunswick, Saskatchewan and the Yukon Territory.

Salaries and wages paid to 95,102 employees amounted to \$124,490,511 of which \$50,279,511 was distributed among 31,125 individuals in the metal mines and metallurgical works; 40,080 people employed in oil and gas fields, coal and other non-metals mines, received \$55,602,313 and clay products and other structural materials industries had 23,897 employees who received \$18,608,687. In the metal mining and metallurgical group there was a marked and steady increase in the number employed during the past five years and in the total of fuels and other non-metallic mining industries the number employed was greater than in 1928, establishing a record year for this group. In the manufacture of clay products and in the production of cement, lime, sand and gravel and stone the total number of men was the largest in the past five years. More complete returns of sand and gravel production were obtained from the province of Québec since 1926, through co-operation with the Bureau of Mines and the Provincial Roads Department, Québec.

The total cost of fuel and electricity used in the mining industry in Canada was \$26,751,585. This figure does not include the coke used in non-ferrous smelting furnaces which amounted to \$3,280,757 in 1929.

Products of the mines, smelters, quarries, sand pits, oil and gas wells, clay products and cement industries, in Canada during 1929, had a net value of \$315,181,388 as against \$279,820,914 in 1928 and \$190,845,547 in 1924. These figures must not be confused with the figures given as the value of mineral production; in calculating the mineral production values, the metals recovered from Canadian ores are valued at average annual prices for these metals in recognized world markets, but the figures given above represent the actual net return to the mines or metallurgical works regardless of the metal content of the shipments or the distance that the ore and other products must be shipped.

IMPORTS AND EXPORTS.—Imports into Canada during the calendar year 1929 of minerals and allied products reached a value of \$659,219,678 as against \$591,039,110 in 1928. These consisted of iron and its products valued at \$342,480,427, non-ferrous metals worth \$90,686,274, non-metallic minerals valued at \$185,921,799, and chemicals and allied products worth \$40,131,178. In the previous year imports of iron and its products were valued at \$322,963,610, non-ferrous metals, \$68,939,379, non-metallic minerals, \$162,172,427, and chemicals and allied products \$36,963,694. Exports of similar products during the same period had a total value of \$289,813,395 as compared with \$218,894,546 in 1928. The 1929 exports of iron and its products were valued at \$90,101,565 as against \$70,665,677 in the previous year; non-ferrous metals, \$148,164,138 as against \$103,411,613; non-metallic minerals, \$29,559,453 as against \$26,395,420; and chemicals and allied products, \$21,988,239 as compared with \$18,544,836 during the year ending December 31, 1928.

An analysis of Canada's external trade in these four groups during 1929 shows that the value of imports from the United States made up 85.5 per cent of the total brought in from all foreign sources; 7.4 per cent of the value of purchases represented goods from the United Kingdom; and the remainder was derived from other countries, chief among which were: Belgium, Germany, Sweden, France, Switzerland and the Netherlands.

Of the total exports of these same groups, 47.9 per cent went to the United States and 25.6 per cent to the British Empire, of which the United Kingdom, Australia, British India and New Zealand were the largest purchasers. Among the remaining countries of the world, the largest importers were: Japan, Argentina, Germany, the Netherlands, China, France, Brazil and Dutch East Indies.

The largest items among Canada's exports of iron and its products were automobiles and automobile parts valued at \$47,000,000 and farm implements worth nearly \$20,000,000; among the non-ferrous metals, gold and silver in the form of bullion and in ore was valued at nearly \$42,000,000; nickel in its various forms, \$26,000,000; pig lead and lead in ore, \$11,000,000; copper in blister form, in ores exported, scrap wire, etc., \$37,400,000; zinc spelter, in ore and zinc scrap, \$9,000,000; and aluminium in bars, blocks, scrap and in manufactured form, \$15,000,000.

Among the exports of the non-metallic mineral products, asbestos took first place at nearly \$13,000,000, followed by coal worth \$4,300,000; artificial abrasive exports amounted to over \$3,800,000, while crude petroleum and gypsum sent out of the country were each valued at more than \$1,000,000. Other important Canadian non-metallic minerals exported were feldspar, talc and magnesite.

In the chemicals and allied products group the chief items exported were cyanamide at \$6,400,000; acids, \$4,800,000; soda and soda compounds, \$4,200,000; ammonium sulphate, \$909,510, and calcium carbide, \$700,000.

PRICES.—The Bureau's index number of articles of mineral origin, raw and partly manufactured, indicated lower price levels generally when compared with the base (1926=100). In January, and February, 1929, the index for this group was 92·7, in March it rose to 94·4 and was followed in April by a recession to 93·3; from May until the end of the year the index number fluctuated between 92 and 93. Higher prices for copper accounted for an increase in the index for non-ferrous metals and their products from 88·7 in 1928 to 92·2 in 1929; in the non-metallic minerals and products a slight advance from 92·9 in 1928 to 93·5 in 1929 was due chiefly to higher prices for coke, coal and glass. Silver prices declined more sharply than at any time since 1920; the position of zinc was weaker; lead was relatively stronger than many others of the non-ferrous group and nickel maintained a price which has remained approximately constant for some years.

Table 4.—Exchange Table Showing Average Monthly Quotations for New York Funds at Montreal, 1925-1929

Month	1925	1926	1927	1928	1929
	\$	\$	\$	\$	\$
January.....	1-0026	1-0020	1-0016	1-0018	1-0027
February.....	1-0014	1-0034	1-0016	1-0019	1-0038
March.....	1-0013	1-0037	1-0037	1-0000	1-0060
April.....	1-0005	0-9996	0-9980	0-9997	1-0076
May.....	1-0000	0-9992	0-9983	1-0009	1-0068
June.....	1-0000	0-9989	1-0006	1-0024	1-0083
July.....	0-9995	0-9987	1-0015	1-0021	1-0049
August.....	0-9995	0-9985	1-0006	1-0000	1-0056
September.....	1-0001	0-9986	0-9995	0-9996	1-0076
October.....	0-9992	0-9993	0-9989	1-0003	1-0144
November.....	0-9992	0-9986	0-9986	0-9999	1-0157
December.....	1-0003	1-0006	1-0010	1-0021	1-0078
Average.....	1-0003	1-0001	1-0005	1-0009	1-0076

Table 5.—Metal Prices, 1925-1929

Commodity	Market	Unit	1925	1926	1927	1928	1929
			\$	\$	\$	\$	\$
Antimony (ordinaries).....	New York.....	Pound.....	0-17494	0-15988	0-12393	0-10305	0-08956
Arsenic, white.....	New York.....	Pound.....	0-0466	0-0350	0-0383	0-04	0-04
Cobalt.....	New York.....	Pound.....	2-50	2-50	2-50	2-63	2-52
Cobalt oxide.....	New York.....	Pound.....	2-10	2-10	2-10	2-10	2-10
Copper.....	New York.....	Pound.....	0-14042	0-13795	0-12920	0-14570	0-18107
	Montreal.....	Pound.....	0-1615	0-1577	0-1478	0-16402	0-19978
	New York.....	Pound.....	0-09020	0-08417	0-06755	0-06305	0-06833
Lead.....	Montreal.....	Pound.....	0-0912	0-08154	0-0673	0-0606	0-06678
	Toronto.....	Pound.....	0-0919	0-08274	0-0683	0-06206	0-06775
	London.....	Pound.....	0-07914	0-06751	0-05256	0-04576	0-05054
Nickel.....	New York.....	Pound.....	0-34	0-36	0-36	0-36	0-35
Platinum.....	New York.....	Ounce.....	119-093	113-269	84-636	78-580	67-655
Silver.....	New York.....	Ounce.....	0-69065	0-62107	0-56370	0-58176	0-52993
Tin.....	New York.....	Pound.....	0-56790	0-63615	0-62747	*0-50427	0-45155
	St. Louis.....	Pound.....	0-07622	0-07337	0-06242	0-06027	0-06512
Zinc.....	Montreal.....	Pound.....	0-0906	0-08825	0-07710	0-07144	0-0687
	London.....	Pound.....	0-07956	0-07410	0-06194	0-05493	0-05386

*Straits tin in 1928. Quotations on 99 per cent tin is continued on April 1, 1928 because of absence of business.

Table 6.—Average Prices of the Principal Metals, 1899-1929 (a)

Year	Copper		Lead			Tin	
	Electrolytic	Standard	New York	St. Louis	London	(f)	(b)
	New York	London				New York	London
1899.....	16-670	73-687	4-470	4-340	14-933	25-120	122-429
1900.....	16-190	73-625	4-370	4-240	16-987	29-900	133-575
1901.....	16-110	66-983	4-330	4-200	12-521	26-740	118-633
1902.....	11-626	52-460	4-069	3-939	11-262	26-790	120-720
1903.....	13-235	57-970	4-237	4-107	11-579	28-090	127-320
1904.....	12-823	58-884	4-309	4-179	11-983	27-690	126-733
1905.....	15-590	69-465	4-707	4-577	13-719	31-358	143-083
1906.....	19-278	87-282	5-657	5-527	17-370	39-819	180-646
1907.....	20-004	87-007	5-325	5-195	19-034	38-166	172-638
1908.....	13-208	59-902	4-200	4-070	13-439	29-465	133-124
1909.....	12-982	58-732	4-273	4-153	13-042	29-725	134-774
1910.....	12-738	57-054	4-446	4-312	12-920	34-123	155-308
1911.....	12-376	55-973	4-420	4-286	13-970	42-281	192-353
1912.....	16-341	72-942	4-471	4-360	17-929	46-096	209-420
1913.....	15-269	68-335	4-370	4-238	18-743	44-252	201-679
1914.....	13-602	(c) 61-524	3-862	3-737	(c) 19-076	34-301	(c) 156-564
1915.....	17-275	72-532	4-673	4-567	22-917	38-590	163-960
1916.....	27-202	116-059	6-858	6-777	31-359	43-480	182-096
1917.....	27-180	124-892	8-787	8-721	30-500	61-802	237-565
1918.....	24-628	115-530	7-413	7-222	30-100	(e)	330-135
1919.....	18-691	90-796	5-759	5-530	28-590	63-328	257-601
1920.....	17-456	97-480	7-957	7-830	37-832	49-101	295-866
1921.....	12-502	69-356	4-545	4-363	22-752	29-916	165-265
1922.....	13-382	62-123	5-734	5-503	24-097	32-554	159-456
1923.....	14-421	65-840	7-267	7-141	27-147	42-664	202-145
1924.....	13-024	63-149	8-097	7-969	34-421	50-176	248-737
1925.....	14-042	61-920	9-020	8-817	36-429	57-893	260-974
1926.....	13-795	57-971	8-417	8-223	31-075	65-285	291-016
1927.....	12-920	55-653	6-755	6-511	24-192	64-353	288-953
1928.....	14-570	63-703	6-305	6-131	21-060	50-427	227-131
1929.....	18-107	75-416	6-833	6-660	23-246	45-155	203-856

Year	Zinc		Antimony, New York	Quick-silver, New York	Aluminum, New York (g)	Silver, New York	Platinum, New York
	St. Louis	London					
1899.....	5-600	24-858	9-430	43-63	32-72	59-580	15-22
1900.....	4-240	20-274	9-500	51-00	32-72	61-330	18-09
1901.....	3-930	17-029	8-250	47-00	33-00	58-950	20-00
1902.....	4-690	18-545	6-120	48-03	33-00	52-160	19-00
1903.....	5-191	20-970	6-000	41-32	33-00	53-570	18-91
1904.....	4-931	22-591	6-371	41-00	35-00	57-221	19-50
1905.....	5-730	25-433	10-250	38-50	35-00	60-352	20-34
1906.....	6-048	27-020	21-730	40-90	35-75	66-791	28-04
1907.....	5-812	23-771	14-840	41-50	45-00	65-327	30-98
1908.....	4-578	20-163	8-004	44-84	28-70	52-864	16-32
1909.....	5-352	22-185	7-466	46-30	22-00	51-502	24-87
1910.....	5-370	23-050	7-386	47-06	22-25	53-486	32-70
1911.....	5-608	25-281	7-540	46-54	20-07	53-304	43-12
1912.....	6-799	26-421	7-760	42-46	22-01	60-835	45-55
1913.....	5-504	22-746	7-520	39-54	23-64	59-791	44-88
1914.....	5-061	(c) 22-544	8-763	48-31	18-63	54-811	45-14
1915.....	13-054	67-553	30-280	87-01	33-98	49-084	47-13
1916.....	12-634	72-071	25-370	125-49	60-71	65-661	83-40
1917.....	8-730	52-413	20-690	106-30	51-59	81-417	102-82
1918.....	7-890	54-180	12-581	123-47	33-53	96-772	105-95
1919.....	6-988	44-879	8-190	92-15	(e)	111-122	114-61
1920.....	7-671	44-372	8-485	81-12	32-72	100-900	110-90
1921.....	4-555	25-845	4-957	45-46	21-11	62-654	75-03
1922.....	5-716	30-003	5-471	58-95	18-68	67-528	97-62
1923.....	6-607	33-058	7-897	66-50	25-41	64-873	116-54
1924.....	6-344	33-728	10-836	69-76	27-03	66-781	118-82
1925.....	7-622	36-624	17-494	83-13	27-19	69-065	119-09
1926.....	7-337	34-105	15-988	91-90	26-99	62-107	113-27
1927.....	6-242	28-513	12-393	118-16	25-40	56-370	84-64
1928.....	6-027	25-284	10-305	123-51	23-90	58-176	78-58
1929.....	6-512	24-790	8-956	122-14	23-90	52-993	67-66

(a) Authorities: Metallgesellschaft—London prices of copper, 1899-1901; of zinc, 1899-1904; of tin, 1889-1913. American Metal Market—aluminum, 1922-1929. W. R. Ingalls—St. Louis lead, 1899-1908 and St. Louis zinc, 1899-1901. All other prices from Engineering and Mining Journal. (b) Standard tin. (c) Average of nine months; no quotations during August, September, and October. (d) Average of 11 months; no quotations in December. (e) No average computed. (f) 99 per cent tin 1899-1919; Straits tin, 1920-1929. (g) Refer also to page 122.

Quotations for copper, lead, tin, zinc, antimony, and aluminum, in New York or St. Louis, are in cents per pound. Quicksilver prices are per flask of 75 lb. Silver is quoted in cents per ounce; platinum, dollars per ounce. All London quotations are given in pounds sterling per long ton.

From 1929 Year Book of the American Bureau of Metal Statistics.

Table 7.—Prices of Non-Metallic Minerals and Structural Materials, 1925-1929, Showing the Average Returns Received by Producers, f.o.b. Shipping Points in Canada as Computed from the Total Receipts and Total Shipments for the Year

Commodity	Unit	1925	1926	1927	1928	1929
NON-METALLICS		\$	\$	\$	\$	\$
Actinolite.....	Ton.....	12-50	12-50	12-50	12-50	12-5
Asbestos.....	Ton.....	30-95	36-14	38-65	41-16	43-03
Barytes.....	Ton.....	23-77	23-07	22-64	22-41	22-29
Bituminous sands.....	Ton.....	4-00	4-00	4-00	4-00	4-00
Coal.....	Ton.....	3-75	3-63	3-55	3-63	3-60
Diatomite.....	Ton.....	.....	.....	25-00	24-34	24-07
Feldspar.....	Ton.....	8-22	8-63	8-68	8-96	9-07
Fluorspar.....	Ton.....	4-94	.....	.....	.....	15-05
Garnets.....	Ton.....	.....	.....	75-00	.....	.....
Graphite.....	Ton.....	61-79	71-45	61-04	52-00	70-61
Grinding pebbles.....	Ton.....	9-00	9-00	.....	.....	.....
Grindstones.....	Ton.....	48-46	56-11	55-53	54-42	54-62
Gypsum (crushed).....	Ton.....	1-83	3-13	3-06	3-00	2-76
Iron Oxides.....	Ton.....	12-91	15-37	16-90	20-54	17-78
Magnesite.....	Ton.....	21-93	30-07	31-39	26-37	26-11
Magnesium sulphate.....	Ton.....	.....	.....	.....	.....	.....
Manganese, Bog.....	Ton.....	.....	.....	.....	5-81	6-08
Mica (rough cobbled).....	Pound.....	0-05	0-04	0-03	0-01	0-01
Mineral water.....	Gal.....	0-14	0-14	0-04	0-12	0-05
Natro-alunite.....	Ton.....	50-00	.....	35-43	.....	.....
Natural gas.....	M cu. ft.....	0-40	0-39	0-38	0-38	0-41
Peat.....	Ton.....	6-12	.....	.....	3-90	5-11
Petroleum, crude.....	Brl.....	3-76	3-59	3-18	3-26	3-33
Phosphate.....	Ton.....	11-81	20-00	11-37	12-90	4-54
Pyrites.....	Ton.....	3-77	3-58	3-90	.....	.....
Quartz.....	Ton.....	1-84	2-38	2-12	1-85	1-11
Salt.....	Ton.....	6-04	5-63	6-00	4-99	4-77
Silica brick.....	M.....	.....	.....	44-40	48-23	43-93
Sodium carbonate.....	Ton.....	7-26	9-02	12-41	9-48	13-47
Sodium sulphate.....	Ton.....	5-06	2-00	2-00	11-43	12-7
Sulphur.....	Ton.....	.....	.....	.....	8-32	8-20
Talc.....	Ton.....	14-22	13-77	14-29	12-00	11-68
Volcanic dust.....	Ton.....	8-62	7-00	7-00	20-19	20-00
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement, portland and puzzolan.....	Brl.....	1-73	1-49	1-43	1-51	1-57
Clay products—						
Brick, common.....	M.....	.....	.....	.....	.....	.....
Brick, pressed.....	M.....	.....	.....	.....	.....	.....
Brick, hollow building.....	M.....	.....	.....	.....	.....	.....
Brick, moulded and ornamental.....	M.....	.....	.....	.....	.....	.....
Brick, face..... Soft mud process.....	M.....	18-83	19-71	20-67	19-95	20-21
Brick, common.....	M.....	11-20	14-65	16-44	14-25	15-44
Brick, face..... Stiff mud process, wire cut.....	M.....	20-06	21-24	21-19	22-09	21-64
Brick, common.....	M.....	14-08	17-26	14-90	15-11	14-68
Brick, face..... Dry press.....	M.....	21-50	21-40	20-96	20-45	21-07
Brick, common.....	M.....	12-24	13-40	12-79	13-87	14-08
Brick, fancy or ornamental.....	M.....	50-20	52-07	47-37	48-01	68-42
Brick, sewer.....	M.....	21-07	17-90	19-15	20-43	20-27
Firebrick.....	M.....	49-27	45-83	45-70	47-46	48-31
Fireclay.....	Ton.....	10-50	9-25	7-08	6-88	6-98
Hollow blocks.....	Ton.....	9-46	9-25	9-45	9-40	9-98
Floor tile.....	Sq. ft.....	0-20	0-22	0-24	0-26	0-23
Kaolin.....	Ton.....	.....	.....	.....	5-00	.....
Paving brick.....	M.....	.....	41-10	42-12	13-20	39-62
Roofing tile.....	No.....	0-08	0-09	0-07	0-03	0-13
Sewer pipe.....	Ton.....	19-51	19-48	19-10	.....	.....
Tile, drain.....	M.....	27-59	27-77	28-88	28-99	28-81
Lime.....	Bush.....	0-33	0-32	0-30	0-31	0-31
Sand and gravel.....	Ton.....	0-29	0-28	0-26	0-21	0-26
Stone—						
Granite.....	Ton.....	2-07	1-48	1-89	1-98	1-78
Limestone.....	Ton.....	1-08	1-07	1-10	1-04	1-05
Marble.....	Ton.....	83-69	98-50	96-57	53-48	29-55
Sandstone.....	Ton.....	1-66	2-54	1-75	2-21	2-50

Table 8.—Annual Values of the Mineral Production of Canada, 1886-1929

Year	Value of production	Value per capita	Year.	Value of production	Value per capita
	\$	\$		\$	\$
1886.....	10,221,255	2-23	1908.....	85,557,101	13-16
1887.....	10,321,331	2-23	1909.....	91,831,441	13-70
1888.....	12,518,894	2-67	1910.....	106,823,623	14-93
1889.....	14,013,113	2-96	1911.....	103,220,994	14-32
1890.....	16,763,353	3-50	1912.....	135,048,296	18-33
1891.....	18,976,616	3-92	1913.....	145,634,812	19-35
1892.....	16,623,415	3-39	1914.....	128,863,075	16-75
1893.....	20,035,082	4-04	1915.....	137,109,171	17-44
1894.....	19,931,158	3-98	1916.....	177,201,534	22-05
1895.....	20,505,917	4-05	1917.....	189,646,821	23-18
1896.....	22,474,256	4-38	1918.....	211,301,897	25-37
1897.....	28,485,023	5-49	1919.....	176,686,390	20-84
1898.....	38,412,431	7-32	1920.....	227,859,665	26-40
1899.....	49,234,005	9-27	1921.....	171,923,342	19-56
1900.....	64,420,877	12-04	1922.....	184,297,242	20-55
1901.....	65,797,911	12-16	1923.....	214,079,331	23-41
1902.....	63,231,836	11-36	1924.....	209,583,406	22-71
1903.....	61,740,513	10-83	1925.....	226,583,333	24-19
1904.....	60,082,771	10-27	1926.....	240,437,123	25-61
1905.....	69,078,999	11-49	1927.....	247,356,695	25-99
1906.....	79,286,697	12-81	1928.....	274,989,487	28-07
1907.....	86,865,202	13-75	1929.....	310,850,246	31-28

Table 9.—Annual Values of the Mineral Production of Canada by Classes, 1907-1929 and by Provinces for 1929

Year	Metallics	Non-metallics including fuels	Clay products and other structural materials	Total
	\$	\$	\$	\$
Canada—				
1907.....	42,426,607	31,275,546	12,863,049	(a)86,865,202
1908.....	41,774,362	32,142,784	11,339,955	(a)85,557,101
1909.....	44,156,841	31,141,251	16,533,349	91,831,441
1910.....	49,438,873	37,757,158	19,627,592	106,823,623
1911.....	46,105,423	34,405,960	22,709,611	103,220,994
1912.....	61,172,753	45,080,674	28,794,869	135,048,296
1913.....	66,361,351	43,463,709	30,809,752	145,634,812
1914.....	59,386,619	43,467,229	26,009,227	128,863,075
1915.....	75,814,841	43,373,571	17,920,759	137,109,171
1916.....	106,319,365	53,414,983	17,467,186	177,201,534
1917.....	106,455,147	63,354,363	19,837,311	189,646,821
1918.....	114,549,152	77,621,946	19,130,799	211,301,897
1919.....	73,262,793	76,002,087	27,421,510	176,686,390
1920.....	77,939,630	108,027,947	41,892,088	227,859,665
1921.....	49,343,232	87,842,682	34,737,428	171,923,342
1922.....	61,785,707	82,076,794	39,534,741	184,297,242
1923.....	84,391,218	91,936,732	37,751,381	214,079,331
1924.....	102,406,528	71,796,009	35,380,869	209,583,406
1925.....	117,082,298	71,851,801	37,649,234	226,583,333
1926.....	115,237,581	85,240,144	39,959,398	240,437,123
1927.....	113,561,030	88,986,246	44,809,419	247,356,695
1928.....	132,012,454	93,239,852	49,737,181	274,989,487
1929.....	154,454,056	97,861,356	58,534,834	310,850,246
By Provinces—1929—				
Nova Scotia.....	55,615	29,513,904	1,334,934	30,904,453
New Brunswick.....	.....	1,853,376	585,696	2,439,072
Quebec.....	13,671,236	14,262,221	18,424,828	46,358,285
Ontario.....	84,202,946	8,458,098	25,001,461	117,662,505
Manitoba.....	465,587	666,841	4,291,397	5,423,825
Saskatchewan.....	.....	1,063,338	1,190,168	2,253,506
Alberta.....	103	31,074,562	3,665,321	34,739,956
British Columbia.....	53,154,681	10,967,168	4,041,029	68,162,878
Yukon Territory.....	2,903,888	1,848	.....	2,905,736
Canada.....	154,454,056	97,861,356	58,534,834	310,850,246

(a) Total includes \$300,000 allowed for products not reported.

Table 10.—Values of the Mineral Production of Canada by Provinces, 1899-1929

Year	Nova Scotia*	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1899.....	6,817,274	420,227	2,585,635	9,819,557		17,103,707		12,482,605	Included
1900.....	9,298,479	439,060	3,292,383	11,258,099		23,452,330		16,680,526	with
1901.....	7,770,159	467,985	3,759,984	13,970,010		19,297,940		20,531,833	Mani-
1902.....	10,686,549	607,129	3,743,636	14,619,091		16,127,400		17,448,031	toba,
1903.....	11,431,914	580,495	3,585,938	14,160,033		14,082,986		17,899,147	Saskat-
1904.....	11,212,746	559,913	3,688,482	12,582,843		12,713,613		19,325,174	chewan
1905.....	11,507,047	559,035	4,405,975	18,833,292		11,387,642		22,386,008	and
1906.....	12,894,303	646,328	5,242,058	25,111,682		10,092,726		25,299,600	Alberta
1907.....	14,532,040	664,467	6,205,553	30,381,638	898,775	533,251	4,657,524	25,656,056	3,335,898
1908.....	14,487,108	579,816	6,372,949	30,623,812	584,374	413,212	5,122,505	23,704,035	3,669,290
1909.....	12,504,810	657,035	7,086,265	37,374,577	1,193,377	456,246	6,047,447	22,479,006	4,032,678
1910.....	14,195,780	581,942	8,270,136	43,538,078	1,500,359	498,122	8,996,210	24,478,572	4,764,474
1911.....	15,409,397	612,830	9,304,717	42,796,162	1,791,772	636,706	6,662,673	21,299,305	4,707,432
1912.....	18,922,236	771,004	11,656,998	51,985,876	2,463,074	1,165,642	12,073,589	30,076,635	5,933,242
1913.....	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	881,142	15,054,046	28,086,312	6,276,737
1914.....	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	712,313	12,684,234	24,164,039	5,418,185
1915.....	18,088,342	903,467	11,619,275	61,071,287	1,318,387	451,933	9,909,347	28,689,425	5,057,708
1916.....	20,042,262	1,118,187	14,406,598	80,461,323	1,823,576	590,473	13,297,543	39,969,962	5,491,610
1917.....	21,104,542	1,435,024	17,400,077	89,066,600	2,628,264	860,651	16,527,535	36,141,926	4,482,202
1918.....	22,317,108	2,144,017	19,605,347	94,694,093	3,120,600	1,019,781	23,109,987	42,935,333	3,355,631
1919.....	23,445,215	2,770,945	21,267,947	67,917,998	2,868,378	1,521,964	21,087,582	34,865,427	1,940,934
1920.....	34,130,017	2,491,787	28,886,214	81,715,808	4,223,461	1,837,468	33,586,456	39,411,728	1,576,726
1921.....	28,912,111	1,901,505	15,157,094	57,356,651	1,934,117	1,114,220	30,562,229	33,230,460	1,754,955
1922.....	25,923,499	2,263,692	17,647,939	65,866,029	2,258,942	1,255,470	27,872,136	39,423,962	1,785,573
1923.....	29,648,893	2,462,457	20,308,763	80,825,851	1,768,037	1,047,583	31,287,536	43,757,388	2,972,823
1924.....	23,820,352	1,969,260	19,136,504	86,398,656	1,534,249	1,128,100	32,344,940	52,298,533	952,812
1925.....	17,625,612	1,743,858	24,884,527	87,980,436	2,276,759	1,076,392	25,318,866	64,485,242	1,791,641
1926.....	28,873,792	1,811,104	25,956,193	84,702,296	3,073,528	1,193,394	26,977,027	65,622,976	2,226,813
1927.....	30,111,221	2,148,535	28,870,403	89,982,962	2,888,912	1,455,225	29,309,223	60,801,170	1,789,044
1928.....	30,524,392	2,198,919	37,037,420	99,584,718	4,186,853	1,719,461	32,531,416	64,496,351	2,709,957
1929.....	30,904,453	2,439,072	46,358,285	117,662,505	5,423,825	2,253,506	34,739,986	68,162,878	2,905,736

*Includes a small production from Prince Edward Island.

Table 11.—Percentage of the Total Value of the Mineral Production of Canada Produced by Each Province, 1925-1929

Province	1925	1926	1927	1928	1929
Nova Scotia*	7.78	12.01	12.17	11.10	9.94
New Brunswick.....	0.77	0.75	0.87	0.80	0.79
Quebec.....	10.72	10.79	11.67	13.47	14.93
Ontario.....	38.82	35.23	36.38	36.22	37.85
Manitoba.....	1.01	1.28	1.17	1.52	1.75
Saskatchewan.....	0.48	0.50	0.59	0.63	0.72
Alberta.....	11.17	11.22	11.85	11.83	11.17
British Columbia.....	28.46	27.29	24.58	23.45	21.92
Yukon.....	0.79	0.93	0.72	0.98	0.93
Canada.....	100.00	100.00	100.00	100.00	100.00

*Includes a small percentage from Prince Edward Island.

Table 12.—Mineral Production of Nova Scotia, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Arsenic..... lb.	35,000	700				
Gold..... fine oz.	3,151	65,137	1,290	26,667	2,687	55,545
Silver..... fine oz.	125	70	77	45	132	70
NON-METALLICS—						
Barytes..... tons	56	1,268	127	2,847	105	2,341
Coal..... tons	7,071,876	27,194,671	6,743,504	27,427,556	7,056,133	28,071,956
Diatomite..... tons	266	6,650	208	4,160	254	5,080
Grindstones..... tons	11	220			6	110
Gypsum..... tons	829,438	1,512,015	1,013,257	1,850,243	948,895	1,152,160
Quartz..... tons	4,834	16,721	7,424	28,022	11,845	31,388
Salt..... tons	14,391	102,590	19,604	118,342	27,819	157,662
Silica brick..... M	1,238	50,978	1,627	69,179	2,385	93,207
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		416,417		496,577		653,157
Lime..... tons	30,562	100,254	36,154	175,876	42,001	154,187
Sand and gravel..... tons	812,976	522,723	296,266	111,103	332,599	151,368
Stone..... tons	72,451	120,807	121,168	213,775	264,706	376,222
Total.....		30,111,221		30,524,392		30,904,453

Table 13.—Mineral Production of New Brunswick, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Antimony..... tons						
Manganese ore..... tons						
NON-METALLICS—						
Coal..... tons	203,950	885,038	207,738	869,104	218,706	909,169
Grindstones..... tons	1,860	97,197	1,609	80,451	1,731	103,514
Gypsum..... tons	85,293	524,550	75,033	501,252	70,482	485,982
Manganese, Bog..... tons			385	2,237		1,800
Natural gas..... M cu. ft.	630,755	124,637	600,981	324,344	678,456	335,002
Petroleum..... bbl.	18,244	41,748	8,043	21,391	7,499	19,909
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		87,185		72,192		160,006
Lime..... tons	12,009	148,321	11,261	130,784	15,518	174,553
Sand and gravel..... tons	388,066	118,768	491,471	54,183	525,857	46,167
Stone..... tons	29,908	121,091	46,332	142,981	27,352	204,970
Total.....		2,148,535		2,198,919		2,439,072

Table 14.—Mineral Production of *Quebec, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Copper..... lb.	3,119,848	403,084	33,697,949	4,909,791	55,337,169	10,019,901
Gold..... fine oz.	8,331	172,217	60,006	1,240,434	90,798	1,876,961
Iron ore, sold for export..... tons	2,029	8,980	2,244	6,732	2,748	7,359
Lead..... lb.	6,496,577	341,461	6,218,336	284,520	5,358,304	270,616
Molybdenite..... lb. (MoS ₂)					16,150	6,400
Silver..... fine oz.	740,864	417,625	908,959	528,796	813,821	431,268
Zinc..... lb.	17,189,046	1,064,690	21,057,760	1,156,745	19,653,440	1,058,731
NON-METALLICS—						
Asbestos..... tons	274,778	10,621,013	273,033	11,238,360	306,055	13,172,581
Feldspar..... tons	12,730	104,618	12,943	104,789	15,790	133,492
Garnets..... tons	2	150				
Graphite..... tons	34	2,043	50	4,668	173	12,652
Iron oxides..... tons	5,931	102,186	5,278	109,383	6,220	113,932
Magnesite..... tons	7,337	230,309	13,195	346,990	18,809	491,170
Mica..... tons	1,454	99,194	1,101	54,224	1,062	72,630
Mineral water..... Imp. gal.	10,330	1,813	15,415	5,608	12,205	2,488
Peat..... tons					1,637	8,829
Phosphate..... tons	31	399	91	1,126	40	800
Pyrites..... tons	13,021	42,795	†1,552	12,061	†9,926	73,119
Quartz..... tons	49,141	132,615	64,577	143,067	46,444	132,532
Talc and soapstone..... tons	1,276	51,504		40,171		47,986
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... bbl.	4,636,751	5,383,058	4,913,820	6,305,396	5,169,408	7,120,374
Clay products.....		2,734,738		3,097,295		3,187,702
Lime—						
Quicklime..... tons	97,078	725,876	102,859	795,999	157,714	1,183,148
Hydrated lime..... tons	10,576	80,789	11,271	100,783	9,478	81,046
Sand and gravel..... tons	8,615,738	1,880,931	8,136,341	1,701,282	6,203,231	1,534,699
Stone..... tons	2,534,531	4,268,315	2,992,192	4,849,200	3,484,471	5,317,859
Total.....		28,870,403		37,037,420		46,358,285

* There is also in this province an important production of aluminium from imported ores.

†Sulphur content of pyrites.

Table 15.—Mineral Production of *Ontario, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Antimony.....	lb.					
Arsenic (As ₂ O ₃).....	lb.	4,961,178	197,668	4,097,226	178,149	3,742,913
Bismuth.....	lb.	2,072	1,003	14,002	5,067	27,446
Cobalt.....	lb.	880,590	1,764,534	954,860	1,671,900	929,415
Copper.....	lb.	45,341,295	4,946,533	66,607,510	8,770,149	88,879,853
Gold.....	fine oz.	1,627,050	33,634,108	1,578,434	32,629,126	1,622,267
Iron pig from Canadian ore.....	tons					
Lead.....	lb.	7,990,709	528,729	6,814,757	402,289	4,769,506
Nickel.....	lb.	66,798,717	15,262,171	96,755,578	22,318,907	110,275,912
Palladium.....	fine oz.	11,545	554,190	13,087	605,563	17,141
Platinum.....	fine oz.	11,217	716,653	10,452	704,360	12,474
Silver.....	fine oz.	9,307,953	5,246,893	7,242,601	4,213,456	8,890,726
Zinc.....	lb.			58,724	3,226	5,516,806
NON-METALLICS—						
Actinolite.....	tons	86	1,075	70	875	30
Asbestos.....	tons					
Beryl Crystals.....	lb.					4,456
Feldspar.....	tons	17,119	154,533	18,954	180,153	21,737
Fluorspar.....	tons					70
Garnets.....	tons					
Graphite.....	tons	1,795	109,613	1,047	52,373	1,288
Grinding pebbles.....	tons					
Gypsum.....	tons	83,998	500,688	85,811	553,271	100,347
Mica.....	tons	1,284	75,183	2,559	32,944	2,991
Mineral water.....	Imp. gal.	293,200	12,811	253,630	27,890	309,700
Natural gas.....	M cu. ft.	7,311,215	4,331,780	7,632,800	4,535,312	8,586,475
Peat.....	tons			1,497	5,845	1,000
Petroleum.....	brl.	139,606	288,347	134,094	249,737	121,194
Phosphate.....	tons	82	824			
Pyrites.....	tons	463	6,077	14,974	54,100	† 4,579
Quartz.....	tons	159,150	266,204	194,503	308,608	187,973
Salt.....	tons	254,181	1,510,777	279,841	1,877,629	302,445
Silica brick.....	M	553	28,549	1,597	86,323	1,566
Talc and soapstone.....	tons	15,138	181,981	14,925	179,187	15,463
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....	brl.	3,751,786	5,144,326	3,911,795	5,520,897	4,624,712
Clay products.....			5,853,035		6,177,664	
Lime—						
Quicklime.....	tons	198,383	1,657,552	228,101	1,870,476	314,243
Hydrated.....	tons	44,749	540,687	49,085	597,367	55,915
Sand and gravel.....	tons	7,512,763	2,405,729	10,389,408	2,230,307	11,358,568
Stone.....	tons	4,254,960	4,060,709	4,581,929	4,041,568	5,239,672
Total.....			59,932,962		99,584,718	117,662,505

* The total production of blast-furnace pig-iron in Ontario in 1927 was 406,148 long tons valued at \$9,202,960; in 1928 it was 734,971 long tons valued at \$14,427,481; and in 1929 it was 769,359 long tons valued at \$15,887,180.

† Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

Table 16.—Mineral Production of Manitoba, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Gold.....fine oz.	182	3,762	19,813	409,571	22,455	464,186
Silver.....fine oz.	12	7	1,763	1,026	2,644	1,401
NON-METALLICS—						
Gypsum.....tons	39,895	512,008	51,285	609,039	67,269	631,051
Natural gas.....M cu. ft.	200	60	200	60	600	180
Quartz.....tons			*1	360	10,045	35,610
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement.....brl.	551,698	1,378,121	693,450	1,685,084	1,000,258	2,350,606
Clay products.....		201,464		291,791		362,240
Lime.....tons	22,714	246,279	28,337	319,699	32,246	361,104
Sand and gravel.....tons	1,333,580	228,655	1,653,929	262,006	1,782,085	322,430
Stone.....tons	154,666	318,556	235,864	608,217	192,109	895,017
Total.....		2,888,912		4,186,853		5,423,825

* Rose quartz.

Table 17.—Mineral Production of Saskatchewan, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
NON-METALLICS—		\$		\$		\$
Coal..... tons	470,216	868,867	471,713	831,491	589,189	993,226
Sodium sulphate..... tons	5,659	11,319	6,016	68,804	5,018	64,112
Volcanic dust..... tons	105	735	485	9,795	300	6,000
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products.....		311,204		377,896		502,522
Sand and gravel..... tons	1,517,801	263,100	2,225,524	431,475	3,496,679	687,646
Total.....		1,455,225		1,719,461		2,253,506

Table 18.—Mineral Production of Alberta, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
METALLICS—		\$		\$		\$
Gold.....fine oz.	42	868	68	1,406	5	103
Silver.....fine oz.	4	3	7	4		
NON-METALLICS—						
Bituminous sands..... tons	2,706	10,824	94	374	989	3,956
Coal..... tons	6,934,162	21,982,058	7,336,330	23,532,414	7,150,693	22,928,182
Natural gas.....M cu. ft.	13,434,621	3,586,533	14,288,605	3,754,466	19,112,931	4,684,247
Petroleum..... brl.	318,741	1,185,948	482,047	1,764,172	988,675	3,458,177
Salt..... tons	100	1,300				
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	601,699	1,303,880	834,067	1,732,582	808,796	1,770,786
Clay products.....		889,358		1,162,264		1,342,427
Lime..... tons	4,570	46,947	6,672	69,588	7,681	79,569
Sand and gravel..... tons	1,392,752	293,674	2,575,708	489,406	1,721,930	447,993
Stone..... tons	3,367	7,830	5,010	24,740	5,183	24,546
Total.....		29,309,223		32,531,416		34,739,986

Table 19.—Mineral Production of British Columbia, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Arsenic..... lb.	1,231,790	13,611	1,334,997	14,903	1,487,175	16,433
Bismuth..... lb.					166,883	283,701
Cadmium..... lb.			491,894	341,374	773,976	675,294
Chromite..... tons					126	900
Cobalt..... lb.			1,730	420		
Copper..... lb.	91,686,297	11,845,870	102,283,210	14,902,664	103,903,738	18,772,778
Gold..... fine oz.	183,094	3,784,889	196,617	4,064,434	154,204	3,187,680
Lead..... lb.	292,770,544	15,388,020	317,722,146	14,537,377	307,999,153	15,555,189
Palladium, Rhodium, etc. fine oz.			520	22,270	177	6,836
Platinum..... lb.	11	960	80	4,549	45	2,823
Silver..... fine oz.	11,040,445	6,223,499	10,943,367	6,366,413	10,156,408	5,382,185
Zinc..... lb.	148,306,479	9,186,103	163,530,890	8,983,079	172,096,841	9,270,857
NON-METALLICS—						
Coal..... tons	2,746,243	10,934,777	2,804,594	11,094,353	2,490,378	10,160,789
Diatomite..... tons			160	4,800	175	5,250
Fluorspar..... tons					17,800	267,000
Grindstones, pulpstones..... tons	380	27,600	246	20,509	210	2,730
Gypsum..... tons	24,493	201,754	20,982	229,843	24,696	243,814
Iron oxides..... tons	194	1,350	136	1,815	298	2,000
Manganese, bog..... tons					1	30
Natro-alunite..... tons	7	248				
Phosphate..... tons	38	494	550	7,150	1,145	4,580
Pyrites..... tons	37,379	149,516	*32,063	254,872	* 28,276	226,208
Quartz..... tons	20,859	80,824	16,017	43,876	9,642	45,947
Sodium carbonate..... tons	805	9,995	519	4,922	600	8,100
Talc..... tons	107	2,620			46	720
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement..... brl.	523,931	1,182,552	670,796	1,495,204	680,907	1,487,223
Clay products.....		679,788		706,039		866,427
Lime—						
Quicklime..... tons	16,175	279,230	24,512	345,131	26,300	355,013
Hydrated..... tons	7,936	97,453	10,637	128,865	13,291	155,579
Sand and gravel..... tons	1,379,143	342,021	2,334,270	529,669	2,425,996	665,132
Stone..... tons	256,553	367,996	271,439	391,820	408,931	511,655
Total.....		60,801,170		64,496,351		68,162,878

*Sulphur content.

Table 20.—Mineral Production of the Yukon, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
METALLICS—						
Copper..... lb.			107,377	15,645		
Gold..... fine oz.	30,935	639,483	34,364	710,367	35,892	741,954
Lead..... lb.	4,165,331	218,929	7,191,449	329,045	8,395,603	424,012
Silver..... fine oz.	1,647,295	928,580	2,839,633	1,651,985	3,279,530	1,737,922
NON-METALLICS—						
Coal..... tons	414	2,052	414	2,915	458	1,848
Total.....		1,789,044		2,709,957		2,905,736

Table 21.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
Metal Mining Industry							
ALLUVIAL GOLD							
1925.....	99	1,419	22,095,659	363	347,448	.....	1,270,419
1926.....	108	1,179	4,702,808	285	339,841	44,482	879,886
1927.....	94	96	9,653,723	321	472,596	30,834	794,033
1928.....	82	82	10,384,575	342	538,270	57,178	852,735
1929.....	68	68	7,237,850	488	586,193	2,969	836,006
AURIFEROUS QUARTZ							
1925.....	52	52	84,964,062	7,052	11,931,948	1,836,050	35,035,361
1926.....	60	60	103,945,022	7,663	12,340,623	2,083,811	35,171,561
1927.....	72	76	118,381,468	8,022	12,935,719	2,222,085	37,452,995
1928.....	98	100	147,693,710	9,066	14,615,990	2,554,657	36,655,330
1929.....	80	85	135,166,105	8,660	14,258,733	2,579,481	37,275,986
COPPER-GOLD-SILVER							
1925.....	40	41	23,200,580	2,374	3,555,844	413,767	7,758,990
1926.....	76	84	27,936,685	3,403	4,546,493	541,914	9,973,049
1927.....	118	125	24,232,169	4,083	5,260,095	596,137	9,822,881
1928.....	164	174	50,004,340	4,777	6,764,309	731,836	15,281,519
1929.....	144	152	52,546,697	5,243	8,498,755	1,035,133	21,859,907
SILVER-COBALT							
1925.....	33	38	44,045,619	1,788	2,576,414	498,874	6,611,644
1926.....	33	37	40,504,721	1,779	2,815,930	518,907	5,470,433
1927.....	23	26	30,123,645	1,458	2,178,163	472,548	4,760,546
1928.....	15	19	22,027,683	1,166	1,809,466	430,683	3,938,884
1929.....	27	32	15,820,435	1,149	1,532,333	407,952	3,918,316
SILVER-LEAD-ZINC							
1925.....	89	94	15,735,930	2,538	3,867,613	584,121	21,902,686
1926.....	108	127	22,699,417	2,924	4,431,730	658,679	26,190,034
1927.....	157	173	28,036,330	3,106	4,807,817	588,520	17,520,130
1928.....	132	150	38,894,892	3,680	5,531,634	671,564	17,123,455
1929.....	149	168	50,573,661	4,153	6,482,392	793,139	22,748,089
NICKEL-COPPER							
1925.....	2	6	38,691,594	1,412	1,867,217	105,570	3,794,244
1926.....	2	6	38,593,359	1,437	1,963,617	95,621	4,627,175
1927.....	2	6	39,272,609	1,617	2,486,313	120,686	5,223,668
1928.....	4	8	45,659,794	1,963	3,136,838	121,005	5,831,640
1929.....	2	5	19,448,290	3,219	5,105,875	184,363	7,967,640
MISCELLANEOUS							
1925.....	3	3	109,583	33	17,301	2,007	23,110
1926.....	2	2	87,588	25	10,626	3,844	11,072
1927.....	5	5	641,600	65	23,944	460	8,880
1928.....	5	5	627,000	62	61,886	8,880	6,732
1929.....	8	8	6,050	94	42,837	10,217	6,400
NON-FERROUS METAL SMELTING AND REFINING							
1925.....	5	6	61,691,928	5,104	8,568,997	5,280,674	*29,304,384
1926.....	7	9	81,779,240	6,226	9,584,938	6,076,627	*33,615,900
1927.....	8	10	85,366,662	7,671	12,120,240	6,380,127	*45,479,578
1928.....	8	10	120,035,742	7,526	12,228,738	5,180,770	*61,080,477
1929.....	7	10	146,699,085	8,119	13,772,393	6,208,733	*68,438,022

* Value added by smelting.

Table 22.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
Total Metal Mining Industries							
1925.....	323	1,659	290,534,965	20,664	32,732,782	8,721,063	105,700,938
1926.....	396	1,504	320,248,840	23,742	36,033,798	10,023,885	115,939,119
1927.....	479	517	335,708,206	26,343	46,284,887	10,411,397	121,062,811
1928.....	508	548	435,327,646	28,582	44,687,131	9,756,573	149,770,772
1929.....	485	528	427,498,173	31,125	50,279,511	11,221,987	163,650,366
Non-Metal Mining Industries including Fuels							
(b) FUELS							
COAL							
1925.....	450	511	145,006,440	25,032	33,200,309	4,069,634	46,835,378
1926.....	433	457	148,278,315	28,368	35,841,796	4,631,691	56,494,375
1927.....	385	437	146,392,808	29,772	38,955,967	3,558,926	58,439,742
1928.....	380	427	146,835,825	30,256	43,320,811	3,679,721	60,462,687
1929.....	357	413	141,766,727	29,739	42,376,378	3,657,355	59,584,545
NATURAL GAS							
1925.....	161	2,236	48,895,802	1,059	1,206,875	13,396	6,588,424
1926.....	169	2,255	57,231,261	1,254	1,448,778	40,444	7,350,170
1927.....	172	2,293	56,777,091	1,342	1,535,498	11,181	7,689,916
1928.....	155	2,073	62,073,384	1,660	2,105,648	34,396	7,216,054
1929.....	145	2,298	68,592,709	1,953	2,275,147	41,590	8,555,971
PETROLEUM							
1925.....	180	2,885	7,954,722	259	318,101	20,990	1,250,705
1926.....	210	2,822	17,639,142	634	788,843	77,902	1,311,665
1927.....	206	2,734	22,773,916	781	1,120,224	112,763	1,516,043
1928.....	190	2,763	31,182,352	1,118	1,916,625	205,183	2,807,528
1929.....	231	2,635	54,526,398	2,221	3,748,689	293,354	4,368,374
TOTAL FUELS							
1925.....	791	5,632	201,856,964	26,350	34,725,285	4,104,020	54,674,917
1926.....	812	5,634	223,143,713	30,258	38,079,417	4,760,087	65,166,210
1927.....	763	5,461	225,943,315	31,895	41,611,689	5,682,870	67,645,701
1928.....	725	5,263	240,091,561	33,034	47,845,084	5,919,900	70,489,269
1929.....	733	5,346	264,886,834	33,913	48,400,214	5,992,299	72,508,890
OTHER NON-METAL MINING INDUSTRIES							
ABRASIVES							
1925.....	8	8	154,733	62	55,466	5,408	126,490
1926.....	8	8	358,342	102	90,069	9,716	152,433
1927.....	9	9	433,810	132	107,603	10,279	132,552
1928.....	9	9	448,618	163	96,558	12,998	119,715
1929.....	9	9	790,791	154	152,805	18,942	122,684
ASBESTOS							
1925.....	14	19	38,133,046	2,582	2,997,107	923,239	8,988,360
1926.....	8	16	34,905,096	2,797	3,544,097	1,012,232	10,099,423
1927.....	7	13	35,316,821	2,976	3,761,192	1,046,541	10,621,013
1928.....	7	14	35,705,212	3,170	3,989,644	1,177,715	11,238,360
1929.....	7	8	33,248,957	3,391	4,410,535	1,335,610	13,172,581

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER NON-METAL MINING INDUSTRIES—Continued</i>							
FELDSPAR							
1925.....	23	25	712,329	240	165,766	11,141	235,789
1926.....	29	30	582,350	410	213,571	14,654	310,238
1927.....	29	29	322,978	234	151,553	10,232	259,151
1928.....	20	21	237,400	223	144,660	12,898	284,942
1929.....	19	20	223,443	209	164,440	14,122	340,471
GRAPHITE							
1925.....	6	6	902,310	106	75,021	14,718	158,763
1926.....	3	3	1,132,273	68	63,064	10,804	194,860
1927.....			Included with	Miscellaneous			
1928.....			"	"			
1929.....			"	"			
GYPSUM							
1925.....	15	16	4,506,995	1,039	1,018,585	189,649	2,389,891
1926.....	18	19	6,696,077	1,368	1,255,427	241,414	2,770,813
1927.....	19	23	9,055,624	1,427	1,311,688	198,199	3,251,015
1928.....	16	22	8,035,319	1,159	1,171,814	242,260	3,743,648
1929.....	17	22	7,438,605	987	1,054,213	281,019	3,345,696
IRON OXIDES							
1925.....	5	5	173,940	47	35,454	16,073	91,913
1926.....	5	5	178,078	45	38,348	17,576	101,843
1927.....	5	5	153,317	48	38,680	18,222	103,536
1928.....	5	5	154,251	45	38,834	18,666	111,198
1929.....	4	4	159,523	48	47,324	13,564	115,932
MICA							
1925.....	36	36	190,144	269	123,079	4,528	261,463
1926.....	22	22	186,478	208	128,269	5,353	229,204
1927.....	21	21	322,389	168	118,505	4,400	174,377
1928.....	16	16	260,074	94	42,159	1,966	87,168
1929.....	14	14	281,295	83	47,362	355	118,549
QUARTZ							
1925.....	14	15	1,005,159	153	145,494	20,495	363,612
1926.....	17	18	1,056,705	243	208,839	44,311	553,161
1927.....	19	20	963,216	267	271,555	34,423	496,364
1928.....	17	18	1,159,085	258	222,672	35,948	523,933
1929.....	19	20	1,000,232	279	189,451	27,340	561,527
SALT							
1925.....	12	13	2,563,508	402	467,487	315,368	1,410,697
1926.....	11	12	2,782,728	384	482,651	324,612	1,480,149
1927.....	10	11	3,194,802	376	499,967	287,260	1,614,667
1928.....	9	10	4,422,922	455	539,775	252,468	1,495,971
1929.....	8	8	4,576,543	424	516,453	249,664	1,578,086
TALC AND SOAPSTONE							
1925.....	7	7	744,037	92	74,519	22,218	205,835
1926.....	6	6	681,434	92	74,634	25,023	217,195
1927.....	8	9	715,439	122	87,721	25,169	236,105
1928.....	5	5	732,608	91	85,161	21,850	219,358
1929.....	5	5	654,635	86	74,300	21,395	229,198

Table 24.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
<i>OTHER NON-METAL MINING INDUSTRIES—Concluded</i>							
<i>MISCELLANEOUS</i>							
1925.....	28	28	2,080,481	218	149,655	58,437	273,327
1926.....	28	28	2,400,850	193	201,468	79,877	386,892
1927.....	32	32	3,315,380	304	313,338	85,302	670,950
1928.....	33	33	4,478,481	394	414,650	128,029	1,002,399
1929.....	38	38	4,042,638	506	545,216	79,463	1,502,574
<i>TOTAL OTHER NON-METAL MINING INDUSTRIES</i>							
1925.....	168	178	51,166,688	5,210	5,307,633	1,531,274	14,506,140
1926.....	155	167	60,960,411	5,910	6,300,437	1,785,572	16,496,211
1927.....	159	172	63,795,776	6,054	6,661,802	1,720,027	17,559,780
1928.....	137	153	65,635,970	6,052	6,745,927	1,904,798	18,826,692
1929.....	140	148	62,416,662	6,167	7,202,099	2,041,474	21,087,298
<i>Total Non-Metal Mining Industries Including Fuels</i>							
1925.....	959	5,810	253,023,646	31,560	40,032,918	5,685,294	69,181,057
1926.....	967	5,701	274,109,129	36,166	44,379,854	6,535,609	81,652,421
1927.....	922	5,633	279,737,591	37,949	48,273,491	5,402,897	85,265,431
1928.....	862	5,416	295,725,531	39,086	54,089,011	5,824,098	89,312,961
1929.....	873	5,494	317,302,496	40,080	55,602,313	6,033,773	93,596,188
<i>Clay Products and Other Structural Materials</i>							
<i>BRICK AND TILE</i>							
1925.....	168	173	22,410,450	3,403	3,167,926	1,565,341	7,374,551
1926.....	178	184	23,034,976	3,644	3,468,052	1,761,516	8,146,514
1927.....	167	176	24,795,253	3,977	3,828,106	1,786,684	8,995,741
1928.....	160	169	26,083,741	4,388	4,153,970	1,985,363	9,853,720
1929.....	173	181	27,503,688	4,740	4,694,434	2,605,532	11,068,520
<i>CLAY SEWER PIPE</i>							
1925.....	5	5	2,810,782	382	461,527	240,038	1,182,454
1926.....	5	5	3,026,076	407	497,512	227,456	1,177,247
1927.....	5	5	3,246,183	421	506,730	214,088	1,137,284
1928.....	5	5	3,746,491	415	511,977	217,003	1,268,020
1929.....	3	5	3,694,716	391	495,666	216,462	1,478,071
<i>FIREBRICK AND OTHER CLAY PRODUCTS</i>							
1925.....	6	6	2,114,738	220	274,919	88,552	702,707
1926.....	5	5	1,780,967	188	249,471	75,544	706,984
1927.....	5	5	2,009,449	199	263,910	71,789	715,608
1928.....	5	5	2,241,716	221	333,628	76,055	891,266
1929.....	5	5	2,295,498	235	351,352	80,875	1,022,055
<i>STONEWARE AND POTTERY</i>							
1925.....	4	4	424,894	131	129,703	15,660	269,979
1926.....	4	4	310,043	149	130,254	15,538	322,726
1927.....	5	5	359,918	152	50,965	12,956	311,085
1928.....	4	4	401,255	161	175,087	15,929	359,562
1929.....	4	4	696,154	155	177,620	17,515	326,408
<i>TOTAL CLAY PRODUCTS*</i>							
1925.....	183	188	27,760,864	4,136	4,084,075	1,909,591	9,529,691
1926.....	194	200	28,152,062	4,356	4,346,687	2,080,064	10,357,323
1927.....	185	194	30,437,607	4,776	4,769,307	2,088,724	11,173,189
1928.....	177	186	32,478,203	5,195	5,181,598	2,294,850	12,331,718
1929.....	180	196	34,190,066	5,530	5,787,014	2,920,384	13,904,643

*Includes kaolin and other clays.

Table 25.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Concluded

Year	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
OTHER STRUCTURAL MATERIALS							
CEMENT							
1925.....	7	11	38,081,583	1,926	2,511,400	2,848,904	14,046,704
1926.....	7	12	41,380,000	2,340	3,052,662	3,424,156	13,013,283
1927.....	6	12	40,509,319	2,270	3,143,932	3,546,000	14,391,937
1928.....	5	11	47,678,841	2,407	3,405,385	3,872,108	16,739,163
1929.....	8	11	50,881,818	2,546	3,623,595	4,347,219	19,337,235
LIME							
1925.....	56	62	5,154,046	1,006	960,434	762,814	3,387,652
1926.....	54	60	5,825,809	1,106	1,082,854	788,990	3,781,484
1927.....	53	63	6,200,481	1,132	1,133,708	826,436	3,923,388
1928.....	46	54	6,952,079	1,218	1,316,115	912,395	4,534,568
1929.....	46	53	7,404,677	1,382	1,393,092	1,183,313	5,908,610
SAND AND GRAVEL							
1925.....	622	622	5,286,268	1,650	1,231,856	158,645	3,220,410
1926.....	580	1,634	6,274,090	5,672	1,557,232	151,236	4,941,434
1927.....	483	2,503	7,668,812	7,133	2,043,962	188,327	6,055,601
1928.....	493	2,553	7,783,135	7,831	2,468,468	193,391	5,809,431
1929.....	541	2,598	9,154,055	8,758	2,505,225	285,491	7,317,814
STONE							
1925.....	201	201	12,233,773	4,148	3,599,653	479,489	7,464,777
1926.....	229	234	12,760,078	4,510	3,763,726	514,374	7,865,874
1927.....	222	258	13,810,984	5,071	4,571,605	496,503	9,265,304
1928.....	254	268	16,027,547	5,129	4,806,514	579,086	10,272,301
1929.....	247	268	20,589,758	5,681	5,459,761	759,418	12,066,532
TOTAL OTHER STRUCTURAL MATERIALS							
1925.....	886	896	60,755,670	8,790	8,803,343	4,249,852	28,119,543
1926.....	870	1,940	66,239,977	13,628	9,456,474	4,878,756	29,602,075
1927.....	764	2,333	68,189,596	15,606	10,893,807	5,057,266	33,633,230
1928.....	798	2,886	78,441,602	16,585	11,996,482	5,556,980	37,355,463
1929.....	842	2,930	88,030,308	18,387	12,831,673	6,575,441	44,630,191
Total Clay Products and Other Structural Materials							
1925.....	1,069	1,084	88,516,534	12,866	12,337,418	6,159,443	37,649,234
1926.....	1,064	2,140	94,392,039	18,023	13,803,161	6,958,810	39,959,398
1927.....	949	3,027	98,627,203	20,382	15,662,514	7,145,990	44,809,419
1928.....	975	3,072	110,914,805	21,780	17,177,880	7,851,330	49,737,181
1929.....	1,028	3,126	122,220,364	23,897	18,608,687	9,495,825	58,534,834
GRAND TOTAL OF ALL INDUSTRIES							
1925.....	2,351	8,553	632,075,145	65,090	85,193,118	20,565,800	212,531,129
1926.....	2,427	9,345	688,750,008	77,931	94,216,813	23,518,304	237,550,938
1927.....	2,350	9,177	714,073,000	84,674	104,220,892	22,960,284	251,077,661
1928.....	2,345	9,036	841,967,982	89,448	115,954,022	23,432,001	279,820,914
1929.....	2,386	9,148	857,021,033	95,102	124,490,511	26,751,585	315,181,388

(b) Production of peat for 1925-1929 included in the miscellaneous non-metallics.

Table 26.—Principal Statistics of the Mineral Industry in Canada by Provinces, 1925-1929

Year	Number of active operators	Number of operating plants or mines	Capital employed \$	Number of employees	Salaries and wages \$	Cost of fuel and electricity \$	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries \$
*Nova Scotia							
1925	67	95	59,456,860	9,905	12,488,285	2,229,275	16,412,311
1926	72	95	60,312,087	13,993	16,109,519	2,941,725	26,702,119
1927	78	107	70,934,465	15,663	18,076,122	2,283,744	27,966,861
1928	76	104	67,329,525	15,497	21,249,053	2,391,558	28,410,600
1929	70	98	67,356,948	14,738	21,035,230	2,436,137	28,529,875
NEW BRUNSWICK							
1925	36	85	3,070,322	1,113	1,003,169	114,629	1,734,613
1926	42	91	3,533,577	1,127	952,696	143,284	1,794,836
1927	41	79	3,014,614	1,196	1,092,891	125,847	2,106,635
1928	42	97	3,331,338	1,244	1,107,462	147,154	2,153,943
1929	36	93	4,945,074	1,361	1,236,726	168,830	2,407,456
QUEBEC							
1925	294	301	83,449,054	8,700	8,566,616	3,152,395	23,817,182
1926	331	1,399	112,460,615	15,555	11,912,344	4,662,165	31,629,450
1927	381	2,428	110,769,954	18,012	15,104,472	4,988,922	39,617,797
1928	402	2,418	133,350,529	17,934	15,921,744	5,953,108	48,631,311
1929	412	2,426	146,332,805	19,678	16,886,275	6,703,881	57,313,685
ONTARIO							
1925	1,209	5,898	258,967,755	19,346	25,909,951	8,463,276	86,641,647
1926	1,142	5,753	278,657,190	20,060	26,987,635	8,668,666	84,710,014
1927	1,014	5,592	282,205,248	21,147	28,753,161	8,642,617	88,824,642
1928	1,022	5,390	325,844,956	23,508	31,912,123	8,343,144	99,003,578
1929	1,012	5,417	302,937,672	24,924	34,897,624	9,766,197	116,174,844
MANITOBA							
1925	25	26	4,948,621	699	711,735	315,005	2,275,772
1926	31	32	10,636,439	780	911,424	442,998	3,069,571
1927	32	33	11,780,120	1,007	1,232,805	590,225	2,888,895
1928	40	41	15,755,174	1,625	1,926,264	631,430	4,183,342
1929	43	51	18,020,285	1,819	2,375,990	992,386	5,423,628
SASKATCHEWAN							
1925	68	68	3,732,909	652	647,014	91,025	1,055,139
1926	73	74	5,119,845	742	708,612	111,661	1,175,139
1927	72	72	5,089,410	1,112	855,704	110,961	1,432,739
1928	77	124	5,647,417	1,229	942,150	140,577	1,686,136
1929	72	126	6,097,476	1,421	1,139,373	173,677	2,211,708
ALBERTA							
1925	390	465	86,735,632	10,486	13,808,354	1,226,903	24,695,870
1926	425	473	102,875,177	10,733	14,499,210	1,380,996	26,351,728
1927	376	461	105,203,514	11,205	15,699,304	1,154,548	28,621,537
1928	362	490	118,556,978	12,358	18,022,037	1,386,358	31,569,442
1929	396	558	142,942,397	13,824	19,915,537	1,476,468	33,883,259
BRITISH COLUMBIA							
1925	161	193	107,257,567	13,727	21,440,904	4,801,665	54,160,830
1926	226	272	108,594,954	14,566	21,556,415	4,913,255	60,367,481
1927	282	329	114,129,277	15,031	22,714,957	4,966,446	58,019,829
1928	271	319	159,445,533	15,720	24,064,962	4,312,507	61,847,246
1929	321	355	170,575,223	16,882	26,073,143	4,943,945	66,256,597
YUKON							
1925	101	1,422	24,456,425	462	527,090	171,627	1,737,765
1926	85	1,156	6,560,124	375	578,958	254,474	1,750,600
1927	74	76	10,946,398	301	691,476	96,974	1,598,726
1928	53	53	12,706,532	333	808,227	126,165	2,335,316
1929	24	24	7,813,153	455	930,613	90,064	2,980,356
CANADA							
1925	2,351	8,553	632,075,145	65,090	85,103,118	20,565,800	212,531,129
1926	2,427	9,345	688,750,008	77,931	94,216,813	23,518,304	237,550,938
1927	2,350	9,177	714,073,000	84,674	104,220,892	22,960,284	251,077,661
1928	2,345	9,036	841,967,982	89,448	115,954,022	23,432,001	279,820,914
1929	2,386	9,118	867,021,033	95,102	124,490,511	26,751,585	315,181,388

*Includes a small production from Prince Edward Island.

Table 27.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1929

(a) Eastern Canada and Total for Canada

Industry	Nova Scotia	New Brunswick	Quebec	Ontario	Total for Eastern Canada	Total for Canada
METAL MINING—						
Number of firms.....	7		121	97	225	485
Capital employed..... \$	3,772,087		69,929,539	202,283,509	275,985,135	427,498,173
Number of salaried employees—						
Male.....	17		333	731	1,081	2,018
Female.....	1		26	60	87	168
Number of wage-earners.....	91		3,718	15,022	18,831	28,939
Total employees.....	109		4,077	15,813	19,999	31,125
Salaries..... \$	28,855		714,971	2,357,779	3,101,605	5,433,603
Wages..... \$	63,742		4,616,620	22,914,011	27,594,373	44,845,908
Total..... \$	92,597		5,331,591	25,271,790	30,695,978	50,279,511
Fuel and electricity purchased..... \$	10,125		2,239,860	4,975,887	7,225,872	11,221,987
Net value of products shipped..... \$	47,700		24,626,636	83,152,184	107,826,520	163,050,366
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	16	12		246	274	733
Capital employed..... \$	55,805,527	3,447,926		42,687,094	101,940,547	264,885,534
Number of salaried employees—						
Male.....	513	37		388	938	2,055
Female.....	51	7		106	164	302
Number of wage-earners.....	12,760	631		1,009	14,400	31,556
Total employees.....	13,324	675		1,503	15,502	33,913
Salaries..... \$	1,061,401	82,493		638,571	1,782,465	4,558,964
Wages..... \$	18,785,513	593,407		969,692	20,348,612	43,841,250
Total..... \$	19,846,914	675,900		1,608,263	22,131,077	48,400,214
Fuel and electricity purchased..... \$	2,159,604	85,349		48,583	2,243,536	3,992,299
Net value of products shipped..... \$	25,705,293	1,230,464		4,776,474	31,712,231	72,508,890
<i>Other Non-Metal Mining—</i>						
Number of firms.....	15	5	50	44	114	140
Capital employed..... \$	5,548,457	942,040	36,646,113	6,586,535	49,723,145	52,416,662
Number of salaried employees—						
Male.....	28	14	213	71	326	369
Female.....	6	4	30	16	56	63
Number of wage-earners.....	616	282	3,718	723	5,339	5,735
Total employees.....	650	300	3,961	810	5,721	6,167
Salaries..... \$	75,516	62,732	489,888	163,120	791,256	887,549
Wages..... \$	518,408	221,467	4,421,298	723,810	5,884,983	6,314,550
Total..... \$	593,924	284,199	4,911,186	886,930	6,676,239	7,202,099
Fuel and electricity purchased..... \$	140,700	53,259	1,379,280	345,005	1,918,244	2,041,474
Net value of products shipped..... \$	1,441,948	501,296	14,262,221	3,244,725	19,540,190	21,087,298
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms.....	32	19	241	625	917	1,028
Capital employed..... \$	2,230,877	555,108	39,757,153	51,380,534	93,923,672	122,220,364
Number of salaried employees—						
Male.....	23	23	305	414	765	950
Female.....	3	3	22	65	93	117
Number of wage-earners.....	629	360	11,313	6,319	18,621	22,830
Total employees.....	655	386	11,640	6,798	19,479	23,897
Salaries..... \$	44,307	46,069	565,386	1,019,498	1,675,260	2,137,573
Wages..... \$	457,488	230,558	6,078,112	6,111,143	12,877,301	16,471,114
Total..... \$	501,795	276,627	6,643,498	7,130,641	14,552,561	18,608,687
Cost of fuel and electricity..... \$	125,708	80,222	3,084,741	4,396,722	7,687,393	9,495,825
Net value of products shipped..... \$	1,334,934	585,696	18,424,828	25,001,461	45,346,919	58,534,834
ALL INDUSTRIES						
Number of firms.....	70	36	412	1,012	1,530	2,386
Capital employed..... \$	67,356,948	4,945,074	146,332,805	302,937,672	521,572,499	867,021,033
Number of salaried employees—						
Male.....	581	74	851	1,604	3,110	5,392
Female.....	61	14	78	247	400	650
Number of wage-earners.....	14,096	1,273	18,749	23,073	57,191	89,660
Total employees.....	14,738	1,361	19,678	24,924	60,701	95,102
Salaries..... \$	1,210,079	191,294	1,770,245	4,178,968	7,350,586	13,017,689
Wages..... \$	19,825,151	1,045,432	15,116,030	30,718,656	66,705,269	111,472,822
Total..... \$	21,035,230	1,236,726	16,886,275	34,897,624	74,055,855	124,490,511
Cost of fuel and electricity..... \$	2,436,137	168,830	6,703,881	9,766,191	19,075,045	26,751,585
Net value of products shipped..... \$	28,529,875	2,407,456	57,313,685	116,174,844	204,425,860	315,181,388

Table 28.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1929—Concluded

(b) Western Canada

Industry	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Total for Western Canada
METAL MINING—						
Number of firms.....	6			231	23	260
Capital employed..... \$	8,449,979			135,452,906	7,610,153	151,513,038
Number of salaried employees—						
Male.....	47			871	19	937
Female.....				79	2	81
Number of wage-earners.....	445			9,232	431	10,108
Total employees.....	492			10,182	452	11,126
Salaries..... \$	136,600			2,120,990	74,408	2,331,998
Wages..... \$	944,866			15,451,664	855,005	17,251,535
Total..... \$	1,081,466			17,572,654	929,413	19,583,533
Cost of fuel and electricity..... \$	154,848			3,751,218	90,049	3,996,115
Net value of products shipped..... \$	465,570			51,779,753	2,978,523	55,223,846
NON-METAL MINING INCLUDING FUELS—						
<i>Fuels</i>						
Number of firms.....	6	58	371	23	1	459
Capital employed..... \$		4,398,322	134,312,230	24,031,735	203,000	162,945,287
Number of salaried employees—						
Male.....		33	827	257		1,117
Female.....		2	116	20		138
Number of wage-earners.....		602	11,760	4,791	3	17,156
Total employees.....		637	12,703	5,068	3	18,411
Salaries..... \$		72,374	2,069,923	634,202		2,776,499
Wages..... \$		602,661	16,794,388	6,094,389	1,200	23,492,638
Total..... \$		675,035	18,864,311	6,728,591	1,200	26,269,137
Cost of fuel and electricity..... \$		68,088	1,046,210	634,450	15	1,748,763
Net value of products shipped..... \$		951,428	30,213,962	9,629,436	1,833	40,796,659
<i>Other Non-Metal Mining—</i>						
Number of firms.....	2	4	2	18		26
Capital employed..... \$		513,714		1,185,197		2,693,517
Number of salaried employees—						
Male.....		10		15		43
Female.....		1		2		7
Number of wage-earners.....		36		226		396
Total employees.....		47		243		446
Salaries..... \$		23,138		23,423		96,293
Wages..... \$		46,801		219,794		429,567
Total..... \$		69,939		243,217		525,860
Cost of fuel and electricity..... \$		33,196		25,035		123,230
Net value of products shipped..... \$		70,112		806,379		1,547,108
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms.....	29	10	23	49		111
Capital employed..... \$	8,680,306	1,185,440	8,525,561	9,905,385		28,296,692
Number of salaried employees—						
Male.....	55	22	42	66		185
Female.....	4	1	5	14		24
Number of wage-earners.....	1,124	714	1,062	1,309		4,209
Total employees.....	1,183	737	1,109	1,389		4,418
Salaries..... \$	130,026	48,180	101,722	182,385		462,313
Wages..... \$	960,929	346,219	940,369	1,346,296		3,593,813
Total..... \$	1,090,955	394,399	1,042,091	1,528,681		4,056,126
Cost of fuel and electricity..... \$	772,839	72,393	429,958	533,242		1,808,432
Net value of products shipped..... \$	4,291,397	1,190,168	3,665,321	4,041,029		13,187,915
ALL INDUSTRIES						
Number of firms.....	43	72	396	321	24	856
Capital employed..... \$	18,020,285	6,097,476	142,942,397	170,575,223	7,813,153	345,448,534
Number of salaried employees—						
Male.....	117	65	872	1,209	19	2,282
Female.....	7	4	122	115	2	250
Number of wage-earners.....	1,695	1,352	12,830	15,558	434	31,869
Total employees.....	1,819	1,421	13,824	16,882	455	34,401
Salaries..... \$	312,378	143,692	2,175,625	2,961,000	74,408	5,667,103
Wages..... \$	2,063,612	995,681	17,739,912	23,112,143	856,205	44,767,553
Total..... \$	2,375,990	1,139,373	19,915,537	26,073,143	930,613	50,434,656
Cost of fuel and electricity..... \$	992,386	173,677	1,476,468	4,943,945	90,064	7,676,540
Net value of products shipped..... \$	5,423,628	2,211,708	33,883,239	66,256,597	2,980,356	110,755,528

Table 29.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					\$	\$	\$
Nova Scotia.....	548	50	14,899	15,497	1,209,239	20,039,814	21,249,053
New Brunswick.....	64	12	1,168	1,244	183,344	924,118	1,107,462
Quebec.....	841	97	16,996	17,934	1,780,283	14,141,481	15,921,744
Ontario.....	1,589	270	21,649	23,508	4,165,808	27,746,315	31,912,123
Manitoba.....	104	17	1,504	1,625	255,696	1,670,568	1,926,264
Saskatchewan.....	49	4	1,176	1,229	112,708	829,442	942,150
Alberta.....	811	75	11,472	12,358	2,036,932	15,985,105	18,022,037
British Columbia.....	1,054	80	14,586	15,720	2,567,564	21,497,398	24,064,962
Yukon.....	21	3	309	333	70,041	738,186	808,227
Canada.....	5,081	608	83,759	89,448	12,381,595	103,572,427	115,954,022
1929							
Nova Scotia.....	581	61	14,096	14,738	1,210,079	19,825,151	21,035,230
New Brunswick.....	74	14	1,273	1,361	191,294	1,045,432	1,236,726
Quebec.....	851	78	18,749	19,678	1,770,245	15,116,030	16,886,275
Ontario.....	1,604	247	23,073	24,924	4,178,968	30,718,656	34,897,624
Manitoba.....	117	7	1,695	1,819	312,378	2,063,612	2,375,990
Saskatchewan.....	65	4	1,352	1,421	143,692	995,681	1,139,373
Alberta.....	872	122	12,830	13,824	2,175,625	17,739,912	19,915,537
British Columbia.....	1,209	115	15,558	16,882	2,961,000	23,112,143	26,073,143
Yukon.....	19	2	434	455	74,408	856,205	930,613
Canada.....	5,392	650	89,060	95,102	13,017,689	111,472,822	124,490,511

*Note on the Method of Computing the Average Number of Wage-earners for Each Industry.—If a company works only 3 months in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 3. If a second company operates every month in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 12. The average number of wage-earners for each other company in the industry is computed in the same way. The average number of wage-earners in the industry during the year is the sum of these individual averages.

Table 30.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1928 and 1929

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					\$	\$	\$
METAL MINING							
Alluvial Gold.....	22	3	317	342	50,836	487,434	538,270
Auriferous Quartz.....	565	43	8,458	9,066	1,637,362	12,978,628	14,615,990
Copper-gold-silver.....	424	37	4,310	4,777	844,646	5,919,663	6,764,309
Silver-Cobalt.....	90	4	1,072	1,166	246,264	1,563,182	1,809,466
Silver-Lead-Zinc.....	284	18	3,378	3,680	646,460	4,885,174	5,531,634
Nickel copper.....	43	1	1,919	1,963	142,249	2,994,589	3,136,838
Miscellaneous.....	4	1	57	62	7,850	54,036	61,886
Non-Ferrous Smelting and Refining.....	612	73	6,841	7,526	1,635,580	10,593,158	12,228,738
NON-METAL MINING INCLUDING FUELS							
<i>Fuels</i>							
Coal.....	1,404	98	28,754	30,256	3,388,453	39,932,353	43,320,811
Natural Gas.....	409	137	1,114	1,660	818,919	1,286,729	2,105,648
Petroleum.....	79	16	1,023	1,118	156,600	1,760,025	1,916,625

* See note above.

Table 30.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1928 and 1929—Concluded

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					\$	\$	\$
<i>Other Non-Metal Mining</i>							
Abrasives.....	10	1	152	163	20,710	75,848	96,558
Asbestos.....	128	19	3,023	3,170	372,070	3,617,574	3,989,644
Feldspar.....	7	1	215	223	14,172	130,488	144,660
Gypsum.....	57	18	1,084	1,159	180,870	990,944	1,171,814
Iron oxides.....	3	.....	42	45	4,074	34,760	38,834
Mica.....	4	2	88	94	6,480	35,679	42,159
Quartz.....	15	2	241	258	24,884	197,788	222,672
Salt.....	45	16	394	455	117,376	422,399	539,775
Talc and Soapstone.....	7	2	82	91	17,410	67,751	85,161
Miscellaneous.....	36	5	353	394	73,118	341,532	414,650
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	113	9	2,285	2,407	256,867	3,148,518	3,405,385
Clay products.....	321	48	4,826	5,195	806,209	4,375,189	5,181,398
Lime.....	84	16	1,118	1,218	184,732	1,131,383	1,316,115
Sand and Gravel.....	83	12	7,736	7,831	199,745	2,268,723	2,468,468
Stone.....	232	26	4,871	5,129	527,634	4,278,880	4,806,514
Total.....	5,081	608	83,759	89,448	12,381,595	103,572,427	115,954,022
1929							
<i>METAL MINING</i>							
Alluvial Gold.....	22	7	459	488	66,881	519,312	586,193
Auriferous Quartz.....	491	33	8,136	8,660	1,543,625	12,715,108	14,258,733
Copper-Gold-Silver.....	401	29	4,813	5,243	900,605	7,598,150	8,498,755
Silver-Cobalt.....	90	6	1,053	1,149	235,450	1,296,883	1,532,333
Silver-Lead-Zinc.....	342	29	3,782	4,153	770,457	5,711,935	6,482,392
Nickel-Copper.....	46	1	3,172	3,219	151,655	4,954,220	5,105,875
Miscellaneous.....	5	.....	89	94	11,090	31,747	42,837
Non-Ferrous Smelting and Refining.....	621	63	7,435	8,119	1,753,840	12,018,553	13,772,393
<i>NON-METAL MINING INCLUDING FUELS</i>							
<i>Fuels</i>							
Coal.....	1,402	110	28,227	29,739	3,293,949	39,082,429	42,376,378
Natural Gas.....	475	137	1,341	1,953	881,525	1,393,622	2,275,147
Petroleum.....	178	55	1,988	2,221	383,490	3,365,199	3,748,689
<i>Other Non-Metal Mining</i>							
Abrasives.....	16	2	136	154	38,648	114,157	152,805
Asbestos.....	172	25	3,194	3,391	419,799	3,990,736	4,410,535
Feldspar.....	5	4	200	209	19,936	144,504	164,440
Gypsum.....	58	13	916	987	175,256	878,957	1,054,213
Iron Oxides.....	2	.....	46	48	3,560	43,764	47,324
Mica.....	5	1	78	83	11,116	36,246	47,362
Quartz.....	17	1	261	279	22,311	167,140	189,451
Salt.....	41	12	371	424	102,502	413,951	516,453
Talc and Soapstone.....	7	2	77	86	13,705	60,595	74,300
Miscellaneous.....	46	4	456	506	80,716	464,500	545,216
<i>CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS</i>							
Cement.....	114	10	2,422	2,546	260,579	3,263,016	3,523,595
Clay Products.....	365	50	5,115	5,530	941,445	4,785,569	5,727,014
Lime.....	91	18	1,273	1,382	158,604	1,234,488	1,393,092
Sand and Gravel.....	89	14	8,655	8,753	189,834	2,315,391	2,505,225
Stone.....	291	25	5,365	5,681	587,111	4,872,650	5,459,761
Total.....	5,392	650	89,060	95,102	13,017,689	111,472,822	124,490,511

* See note page 37.

Table 31.—Wage-Earners in the Mineral Industry in Canada, by Months and by Classes, 1928 and 1929

Month	Metal Mining	Non-Metal Mining including Fuels			Clay Products and other Structural Materials			Total
		Fuels	Other Non-Metal-lics	Total	Clay Products	Other structural materials	Total	
1928								
January.....	22,378	32,880	4,435	37,315	2,421	4,967	7,388	67,081
February.....	22,857	31,328	4,323	35,651	2,370	5,171	7,541	66,049
March.....	23,550	30,213	4,419	34,632	2,912	5,959	8,871	67,053
April.....	23,748	28,675	4,740	33,415	3,503	7,319	10,822	67,985
May.....	24,906	28,463	5,360	33,823	4,665	10,002	14,667	73,396
June.....	25,524	29,049	5,637	34,686	4,980	15,383	20,363	80,573
July.....	25,663	29,486	5,691	35,177	5,129	15,480	20,609	81,449
August.....	25,862	30,166	5,813	35,979	5,136	11,245	16,381	78,222
September.....	26,177	30,782	5,910	36,692	4,700	10,502	15,202	78,071
October.....	26,474	32,584	5,927	38,511	4,362	10,073	14,435	79,420
November.....	25,737	32,741	5,724	38,465	4,008	9,251	13,259	77,461
December.....	24,745	32,666	5,372	38,038	3,348	7,249	10,597	73,380
*Average.....	26,358	30,891	5,674	36,565	4,826	16,010	20,836	83,759
1929								
January.....	25,052	31,961	4,155	36,116	2,838	6,081	8,919	70,087
February.....	25,330	31,564	4,423	35,987	2,445	5,998	8,443	69,760
March.....	25,377	29,531	4,687	34,218	2,950	6,799	9,749	69,344
April.....	25,917	28,300	4,952	33,252	4,043	8,630	12,673	71,842
May.....	27,262	27,992	5,803	33,795	5,123	10,979	16,102	77,159
June.....	28,066	29,011	5,898	34,909	5,586	17,002	22,588	85,593
July.....	28,755	29,440	6,085	35,525	5,675	17,384	23,059	87,339
August.....	28,989	30,424	6,090	36,514	5,654	12,111	17,765	83,268
September.....	28,921	32,416	6,137	38,553	5,210	11,195	16,405	83,879
October.....	29,417	33,799	5,968	39,767	4,707	10,521	15,228	84,412
November.....	28,993	33,894	5,527	39,421	4,307	9,066	13,373	81,787
December.....	27,268	33,727	5,037	38,764	3,598	6,853	10,451	76,483
*Average.....	28,939	31,556	5,735	66,230	5,115	17,715	22,830	89,060

* See note page 37.

Table 32.—Wage-Earners in the Mineral Industry in Canada, by Months and by Provinces, 1928 and 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Canada
1928										
January.....	14,216	817	8,592	16,485	718	776	12,566	12,726	185	67,081
February.....	14,089	803	8,578	16,786	741	648	11,359	12,860	185	66,049
March.....	14,195	853	9,491	17,507	835	614	10,343	13,036	179	67,053
April.....	14,635	885	9,952	18,724	925	496	9,100	12,965	303	67,985
May.....	15,116	1,110	11,614	20,628	1,333	695	8,775	13,759	366	73,396
June.....	15,171	1,141	16,734	21,429	1,453	730	9,356	14,220	339	80,573
July.....	15,051	1,162	16,821	21,667	1,502	625	9,936	14,351	334	81,449
August.....	14,872	1,078	13,115	21,581	1,460	630	10,844	14,287	355	78,222
September.....	14,347	1,071	12,832	21,451	1,305	784	11,448	14,439	394	78,071
October.....	14,332	1,341	12,587	21,429	1,161	1,033	12,412	14,759	366	79,420
November.....	14,524	1,056	12,224	20,131	1,100	1,074	12,932	14,113	307	77,461
December.....	14,404	997	10,783	18,683	927	810	13,000	13,520	256	73,380
*Average.....	14,899	1,168	16,996	21,649	1,504	1,176	11,472	14,586	309	83,759
1929										
January.....	13,572	1,032	9,468	18,074	828	784	12,648	13,426	255	70,087
February.....	13,392	1,080	9,410	18,158	834	748	12,556	13,319	263	69,760
March.....	13,477	1,075	9,700	18,932	958	723	10,747	13,890	272	69,344
April.....	13,557	1,084	10,526	20,628	1,206	760	9,624	14,159	298	71,842
May.....	13,981	1,231	12,504	22,420	1,492	895	9,922	14,298	416	77,159
June.....	14,213	1,303	18,230	23,084	1,897	937	10,821	14,655	443	85,593
July.....	14,080	1,347	18,626	23,683	1,951	809	11,248	15,054	460	87,339
August.....	13,973	1,340	13,669	23,820	2,028	827	12,093	15,053	465	83,268
September.....	14,285	1,292	13,357	23,199	1,802	1,030	13,074	15,374	466	83,879
October.....	14,261	1,245	13,118	23,010	1,575	1,033	14,094	15,655	421	84,412
November.....	14,076	1,175	12,541	22,034	1,382	957	14,078	15,207	337	81,787
December.....	13,869	1,015	11,133	20,326	1,062	856	13,946	14,003	273	76,483
*Average.....	14,096	1,273	18,749	23,673	1,695	1,352	12,830	15,558	434	89,060

* See note page 37.

Table 33.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1928 and 1929

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 hours
1928				
By Provinces—				
Nova Scotia.....	4,541	1,093	776	68
New Brunswick.....	247	781	196	10
Quebec.....	2,638	2,465	12,824	779
Ontario.....	12,915	5,677	4,257	843
Manitoba.....	375	186	978	76
Saskatchewan.....	85	17	900	27
Alberta.....	12,770	657	640	178
British Columbia.....	15,907	71	18	14
Yukon.....	218	3	191	15
Canada.....	49,696	10,950	20,780	2,010
By Industries—				
METAL MINING—				
Alluvial Gold.....	249	7	203	29
Auriferous Quartz.....	7,690	1,480	73	85
Copper-Gold-Silver.....	3,697	935	232	37
Silver-Cobalt.....	910	250	6	7
Silver-Lead-Zinc.....	3,696	171	234	29
Nickel-Copper.....	1,827	489	27	9
Miscellaneous.....	25	38		8
Non-Ferrous Smelting and Refining.....	5,877	818	953	78
NON-METAL MINING INCLUDING FUELS—				
Fuels—				
Coal.....	21,804	687	1,002	38
Natural Gas.....	345	937	33	8
Petroleum.....	680	249	74	57
Other Non-Metal Mining—				
Abrasives.....	10	28	152	6
Asbestos.....	18	60	3,205	71
Feldspar.....		129	132	
Gypsum.....	88	906	439	69
Iron Oxides.....			32	25
Mica.....	24	17	37	
Quartz.....	43	32	214	
Salt.....	68	222	98	13
Talc and Soapstone.....	12	6	64	
Miscellaneous.....				
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	809	458	878	587
Clay Products.....	846	1,363	3,046	390
Lime.....	247	347	680	108
Sand and Gravel.....	172	94	4,903	221
Stone.....	559	1,227	4,063	135
Total.....	49,696	10,950	20,780	2,010
1929				
By Provinces—				
Nova Scotia.....	15,707	852	774	20
New Brunswick.....	297	909	220	22
Quebec.....	3,271	2,824	8,907	869
Ontario.....	14,009	6,314	4,983	895
Manitoba.....	842	295	1,127	289
Saskatchewan.....	74	95	858	62
Alberta.....	14,686	823	618	123
British Columbia.....	17,934	157	90	25
Yukon.....	504	1	2	
Canada.....	66,824	12,270	17,579	2,305
By Industries—				
METAL MINING—				
Alluvial Gold.....	415	74	74	10
Auriferous Quartz.....	7,335	1,448	138	70
Copper-Gold-Silver.....	4,463	1,067	150	81
Silver-Cobalt.....	837	242	4	9
Silver-Lead-Zinc.....	4,166	142	262	34
Nickel-Copper.....	3,219	685	260	2
Miscellaneous.....	47	26	23	
Non-Ferrous Smelting and Refining.....	6,514	1,071	807	44

Table 33.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1928 and 1929—Concluded

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 hours
Non-Metal Mining Including Fuels—				
<i>Fuels—</i>				
Coal.....	33,860	930	852	20
Natural Gas.....	468	879	37	6
Petroleum.....	1,963	172	97	71
<i>Other Non-Metal Mining—</i>				
Abrasives.....	22	30	175	2
Asbestos.....		55	3,238	68
Feldspar.....		146	132	
Gypsum.....	91	536	478	130
Iron Oxides.....			39	16
Mica.....	9	35	63	
Quartz.....	58	36	240	6
Salt.....	43	179	158	20
Talc and Soapstone.....		6	72	
Miscellaneous.....	160	46	304	39
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement.....	943	551	845	482
Clay Products.....	829	1,986	3,010	435
Lime.....	310	295	780	226
Sand and Gravel.....	256	266	796	99
Stone.....	816	1,367	4,545	435
Total.....	66,824	12,270	17,579	2,305

Table 34.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING						
Alluvial Gold.....Quantity						
Auriferous Quartz.....Quantity	\$ 1,233	25,338	323			192
Copper-Gold-Silver.....Quantity	\$ 14,601	259,426	6,085			2,913
Silver-Cobalt.....Quantity	\$ 6,498	40		15		32
Silver-Lead-Zinc.....Quantity	\$ 51,679	426		840		659
Nickel-Copper.....Quantity	\$ 7,594		780			
Miscellaneous.....Quantity	\$ 89,546		12,300			
Non-Ferrous Smelting and Refining.....Quantity	\$ 27,139	3,563	12	389		624
	\$ 136,881	32,126	312	3,878		5,183
	\$ 2,546		38			145
	\$ 15,891		678			1,520
	\$ 150					
	\$ 1,200					
	\$ 70,362	152,230	238			*3,929
	\$ 445,475	982,235	3,064			42,125
Total.....Quantity	105,382	191,311	1,391	404		4,922
	\$ 649,836	1,379,650	22,439	4,718		52,400
NON-METAL MINING, INCLUDING FUELS						
<i>Fuels</i>						
Coal.....Quantity	859,922			153,746		
Natural Gas.....Quantity	\$ 3,073,544			135,975		
Petroleum.....Quantity	\$ 161	72				1
	\$ 1,197	697				12
	\$ 2,589			522		
	\$ 22,663			3,174		
Total.....Quantity	862,682	72		154,268		1
	\$ 3,097,404	697		139,149		12
<i>Other Non-Metal Mining</i>						
Asbestos.....Quantity	38,893	12,186	14,123			2,357
Feldspar.....Quantity	\$ 266,607	94,642	95,224			28,617
Gypsum.....Quantity	\$ 11,528	6,693				
Iron Oxides.....Quantity	\$ 70,736	5,980	5			590
Mica.....Quantity	\$ 1,001	44,965	53			4,957
Quartz.....Quantity	\$ 7,197		341			
Salt.....Quantity	\$ 78	60				
Talc.....Quantity	\$ 557	420				
	\$ 2,576	3,590				
	\$ 11,310	22,970				
	\$ 218,416	47,481				
	\$ 394					
	\$ 2,563					
	\$ 6,123	6,209	2			
	\$ 37,691	34,519	31			
	\$ 1,057					
	\$ 7,534					
Total.....Quantity	61,256	76,664	14,152			2,947
	\$ 401,632	420,188	95,649			53,674
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement.....Quantity	276,721	282,914		20,358		84
Clay Products.....Quantity	\$ 1,473,885	1,551,324		61,126		781
Lime.....Quantity	\$ 30,870	205,688	4,676	27,058		4,745
Sand and Gravel.....Quantity	\$ 211,385	1,284,679	33,557	56,785		33,553
Stone.....Quantity	\$ 18,409	57,762	1,642	90		10,940
	\$ 125,620	285,337	7,383	450		73,143
	\$ 3,873	22,627		193		
	\$ 28,614	128,006		647		
	\$ 6,908	24,027	575	90		
	\$ 45,231	163,193	3,257	736		
Total.....Quantity	336,781	593,018	6,893	47,789		15,769
	\$ 1,894,735	3,412,539	44,197	119,744		107,477
Canada.....Quantity	1,366,101	861,065	22,436	202,461		23,639
	\$ 6,033,607	5,213,074	162,285	263,611		183,463

*Coke used for fuel only. Coke used in smelting amounted to 187,960 tons valued at \$1,824,061.

Industry in Canada, by Kinds and by Industries, 1928

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. Gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
500	95	800	1,280				4,764,440		3,080,890	6,744,140
545	76	640	8,273				47,644	57,178		67,741
72,891	15,766	1,458,077	26,504				224,756,744		9,090,375	145,705
24,045	4,656	122,963	116,472			1,434	2,002,062	2,554,657		2,914
65,479	26,507	676,058	17,744				66,446,922		30,117,509	
25,277	5,522	72,130	84,762				490,541	731,836		
3,121	90	93,485	1,099				15,596,388			
944	22	12,994	6,252			26,220	282,405	430,683		
68,714	4,553	431,156	9,002				47,255,254		867,522	
31,773	1,020	92,265	55,776			1,418	310,932	671,564		
15,049	1,438	65,171	30				38,148,448			
4,194	321	7,218	105				91,078	121,005		
200	200		1,500					8,880		
100	80		7,500				1,133,644,412		257,742,837	
53,472	9,160	7,920,699	7,867	30,011	185		3,046,772	5,180,770		
15,109	2,520	579,190	59,046	3,717	154	1,363				
279,426	57,809	10,645,446	65,026	30,011	185		1,530,612,608		300,899,133	6,889,845
101,987	14,217	887,400	338,186	3,717	154	30,435	6,271,434	9,756,573		70,655
10,287	2,441						29,598,802		108,926,689	4,157,361
3,323	702						466,177	3,679,721		76,527
			36		72,756		746		8,550	
			322		32,120		48	34,396		
29,703	3,600	184,124	172		1,723,255		2,197,500		88,000	
8,750	1,440	15,464	1,054		124,256		28,382	205,183		
59,990	6,041	184,124	208		1,796,011		51,797,048		109,023,239	4,157,361
12,073	2,142	15,464	1,876		156,376		494,607	3,919,300		76,587
14,898	5,222	2,350					62,593,252			
3,278	1,149	306					687,892	1,177,715		
12,462			733							
3,237			2,968					12,598		
158,027		176,065	1,690		3,550		5,060,964		64,000	
35,401		16,100	3,351		1,516		65,181	242,260		
1,600		145	1,592				144,728			
472		17	7,744				2,895	18,666		
1,100			200							
308			1,238					1,966		
2,352	1,016	55,615					630,000			
571	242	3,391					8,217	35,948		
		27,272	2				1,845,790			
		3,548	8			6,472	17,714	252,468		
			60				1,404,700			
			68				19,219	21,850		
1,079	125	277,965	2,409	7,859			2,535,760			
2,233	31	22,874	9,271	628			22,751	128,029		
2,223			833				74,000			
500			3,009				1,955	12,998		
193,741	6,363	539,419	7,509	7,859	3,550		74,289,194		64,000	
44,000	1,422	46,836	27,657	698	1,516	6,472	826,824	1,904,798		
7,486	803						179,771,381		12,087,200	
1,695	168						783,129	3,872,108		
34,174	2,345	339,815	55,337	629	727,218		15,640,454		1,000	
7,981	512	33,300	306,344	50	36,907		289,297	2,294,350		
1,465	245	385,525	71,561	217,108	13,000		4,864,482		343,658	
338	61	15,746	324,943	17,369	6,500		55,505	912,395		
24,983	2,005	28,710	125				1,522,877			
5,788	492	2,153	900				26,791	193,391		
85,210	4,500	67,706	3,313				17,893,126		1,400,000	
20,065	1,128	5,497	14,493				325,486	579,086		
153,318	9,898	821,756	130,336	217,737	740,218		219,692,320		13,831,858	
35,867	2,361	56,696	646,680	17,419	43,407		1,480,208	7,851,330		
666,475	80,111	12,190,738	203,079	255,607	2,539,964		1,856,391,170		423,818,230	11,047,266
193,927	20,142	1,005,796	1,013,899	21,764	201,453	36,907	9,072,073	23,432,001		147,182

Table 35.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING						
Alluvial Gold.....Quantity	1		4			
\$	5		80			
Auriferous Quartz.....Quantity	591	23,603	1,451			195
\$	7,718	240,803	8,408			3,456
Copper-Gold-Silver.....Quantity	4,088	1,297		3	2	44
\$	45,050	10,927		121	26	854
Silver-Cobalt.....Quantity		6,424	783			
\$		72,857	12,308			
Silver-Lead-Zinc.....Quantity	40,204	2,815	19	157	111	220
\$	198,195	25,047	554	1,338	1,177	2,193
Nickel-Copper.....Quantity		6,614	64			72
\$		41,414	1,085			636
Miscellaneous.....Quantity		2				
\$		12				
Non-Ferrous Smelting and Refining.....Quantity	81,613	165,069				*14,014
\$	616,384	1,016,939				146,330
Total.....Quantity	126,497	205,824	2,321	160	113	14,545
\$	867,352	1,407,999	22,435	1,459	1,203	153,469
NON-METAL MINING, INCLUDING FUELS						
<i>Fuels</i>						
Coal.....Quantity	828,352			152,248		
\$	2,932,230			142,141		
Natural Gas.....Quantity	1,783					2
\$	8,545					28
Petroleum.....Quantity	5,163			2,757		
\$	38,691			19,071		
Total.....Quantity	835,298			155,005		2
\$	2,979,466			161,212		28
<i>Other Non-Metal Mining</i>						
Asbestos.....Quantity	39,590	16,427	16,371			1,682
\$	284,225	126,149	107,320			21,016
Feldspar.....Quantity		799			1	
\$		6,524			16	
Gypsum.....Quantity	11,646	8,132				1,298
\$	68,375	61,434				12,965
Iron Oxides.....Quantity	1,034		22			
\$	8,916		330			
Mica.....Quantity		40				
\$		280				
Quartz.....Quantity	45	3,176				
\$	382	18,010				
Salt.....Quantity	2,005	49,713				
\$	9,641	216,911				
Talc.....Quantity		370				
\$		2,450				
Miscellaneous.....Quantity	2,431	2,188	2			
\$	13,715	9,402	31			
Natural Abrasives.....Quantity	1,753			190		26
\$	13,996			847		312
Total.....Quantity	58,594	80,845	16,395	190	1	3,006
\$	399,250	441,166	107,681	847	16	34,293

* Coke used for fuel only. Coke used in smelting amounted to 368,322 tons, valued at \$3,285,757.

Table 35.—Fuel and Electricity Used in the Mineral

Industry	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement.....Quantity	308,090	298,969		11,826		130
\$	1,597,808	1,750,170		43,726		1,362
Clay Products.....Quantity	30,425	266,046	3,550	28,309		4,279
\$	210,132	1,725,021	28,074	61,970		31,193
Lime.....Quantity	39,948	90,014	1,225			11,760
\$	254,344	421,968	5,156			79,607
Sand and Gravel.....Quantity	3,552	33,636	16	1,097		
\$	27,646	188,389	248	3,403		
Stone.....Quantity	12,131	27,617	677			4
\$	81,422	189,384	4,853			40
Total.....Quantity	394,146	716,282	5,468	41,232		16,173
\$	2,171,352	4,274,932	38,331	109,099		112,202
Canada.....Quantity	1,414,535	1,002,951	24,184	196,587	114	33,726
\$	6,417,420	6,124,097	168,447	272,617	1,219	299,992

Table 36.—Fuel and Electricity Used in the Mineral

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia.....Quantity	530,871		5			4,111
\$	2,069,222		53			20,456
New Brunswick.....Quantity	17,480	4	1			1
\$	91,458	80	9			12
Quebec.....Quantity	282,196	151,521	17,028	90		6,570
\$	1,637,153	1,064,044	117,317	736		72,640
Ontario.....Quantity	1,626	674,424	4,572			12,136
\$	12,457	3,874,977	37,780			93,235
Manitoba.....Quantity	211	35,015	290	15		2
\$	2,467	272,991	2,882	840		36
Saskatchewan.....Quantity	6,069			55,864		
\$	52,397			63,924		
Alberta.....Quantity	168,552			146,103		49
\$	613,854			194,233		172
British Columbia.....Quantity	359,091	101	540	389		770
\$	1,554,574	982	4,244	3,878		6,912
Yukon.....Quantity	5					
\$	25					
Canada.....Quantity	1,366,101	861,065	22,436	202,461		23,639
\$	6,033,607	5,213,074	162,285	263,611		193,463

in Canada, by Kinds and by Industries, 1929—Concluded

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
18,689 4,501	2,798 612	27,471 3,571	.....	.....	.....	.....	200,133,083 945,469	..... 4,347,219	16,386,100	.....
57,352 13,360	2,109 639	222,950 24,793	65,711 339,282	.....	915,979 36,853	.....	30,018,402 449,067	..... 2,920,384	.....	.....
3,706 967	310 76	343,245 11,330	73,104 310,792	268,588 21,487	17,549 8,537	.....	9,443,592 69,049	..... 1,183,313	387,286	.....
80,030 19,638	594 135	2,792 1,023	.....	.....	.....	.....	3,722,349 45,009	..... 285,491	.....	.....
171,074 43,145	61,517 9,866	186,489 18,231	3,841 18,582	.....	.....	.....	25,405,092 393,895	..... 759,418	1,313,359	.....
330,851 81,611	67,328 11,328	782,947 58,948	142,656 668,656	268,588 21,487	933,528 45,390	.....	268,722,518 1,902,489	..... 9,495,825	18,086,745	.....
944,173 287,817	100,333 20,604	17,583,360 1,431,987	215,194 1,030,866	678,290 66,412	6,508,897 249,432	27,641	1,954,411,658 10,353,034	26,751,585	351,044,447	42,124,831 368,779

Industry in Canada, by Provinces, 1928

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
160,816 36,568	90 24	157,546 23,411	5,963 25,088	225,596 18,047	.....	.....	7,951,307 198,689	..... 2,391,558	77,226,074	1,660,657 22,607
850 229	100 24	.....	10,545 45,879	.....	12,313 3,045	.....	262,080 6,418	..... 147,154	1,154,000	.....
141,560 40,774	37,177 7,986	368,429 35,802	44,794 221,463	.....	.....	.....	801,098,212 2,755,193	..... 5,953,108	232,267,916	.....
152,223 36,566	26,730 6,999	5,985,971 500,445	80,331 418,929	.....	95,466 53,462	32,866	469,852,186 3,275,428	..... 8,343,144	8,926,858	145,705 2,914
34,287 15,424	1,675 606	101,600 42,512	29,458 170,520	.....	.....	.....	13,640,020 123,152	..... 631,430	.....	.....
4,535 1,279	.....	272,613 22,421	2 2	.....	.....	.....	8,950 532	..... 140,577	1,000	.....
36,855 11,209	6,041 2,142	184,124 15,464	2,495 11,054	.....	2,432,185 144,946	.....	38,806,503 393,284	..... 1,386,358	17,873,454	1,142,637 26,838
120,156 38,333	8,298 2,361	5,019,033 316,027	28,701 105,705	30,011 3,717	.....	.....	520,007,472 2,271,733	..... 4,312,507	82,420,516	1,354,067 27,082
15,193 13,545	.....	101,422 49,714	790 15,237	.....	.....	.....	4,764,440 47,644	..... 126,165	3,948,412	6,744,140 67,741
666,475 193,927	80,111 20,142	12,190,738 1,005,796	203,079 1,013,899	255,607 21,764	2,539,964 201,453	36,907	1,856,391,170 9,072,073	23,432,001	423,818,230	11,047,206 147,182

Table 37.—Fuel and Electricity Used in the Mineral

Province	Bituminous coal		Anthra- cite coal	Lignite coal		Coke
	Can- adian	Im- ported		Can- adian	Im- ported	
	Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia.....Quantity	543,300	5				2,660
\$	2,092,293	75				13,280
New Brunswick.....Quantity	18,004					28
\$	97,437					340
Quebec.....Quantity	340,148	127,046	20,082		1	12,658
\$	2,012,144	939,007	134,656		16	134,480
Ontario.....Quantity	1,483	807,713	3,753		2	13,546
\$	9,300	4,622,410	29,251		26	100,794
Manitoba.....Quantity	1,945	68,035	160	126		570
\$	17,638	560,154	1,600	1,058		6,952
Saskatchewan.....Quantity	7,233			56,108		
\$	63,738			80,870		
Alberta.....Quantity	176,747			140,196		4
\$	622,854			189,351		40
British Columbia.....Quantity	325,672	152	189	157	111	4,260
\$	1,502,001	2,451	2,940	1,338	1,177	44,106
Yukon.....Quantity	3					
\$	15					
Canada.....Quantity	1,414,535	1,002,951	24,184	196,587	114	33,726
\$	6,417,420	6,124,097	168,447	272,617	1,219	299,992

Industry in Canada, by Provinces, 1929

Gasoline	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
150,206	1,409	104,756	5,422	395,759	.....	.....	9,822,335	.....	81,274,632	3,761,935
38,036	358	12,434	23,097	31,661	.....	.....	224,903	2,436,137	.....	27,169
4,856	786	18,823	15,752	.....	12,680	.....	120,528	.....	1,066,000	.....
1,349	230	2,183	60,432	.....	3,240	.....	3,619	168,830	.....	.....
193,231	18,124	631,740	48,917	.....	.....	.....	774,496,590	.....	154,606,482	.....
60,281	4,627	85,218	242,869	.....	.....	277	3,090,306	6,703,881	.....	.....
258,930	70,190	10,058,639	70,121	.....	84,101	.....	509,016,141	.....	14,590,545	2,805,900
69,423	12,110	815,179	367,068	.....	42,644	26,194	3,671,798	9,766,197	.....	28,059
48,685	2,584	180,000	32,135	.....	.....	.....	21,099,216	.....	.....	.....
17,230	895	55,886	172,128	.....	.....	.....	158,845	992,386	.....	.....
9,332	2,000	273,272	444	.....	.....	.....	48,631	.....	1,050,000	.....
2,698	600	22,527	1,698	.....	.....	.....	1,546	173,677	.....	.....
51,738	1,971	342,320	4,940	.....	6,412,116	.....	39,269,164	.....	13,022,478	1,264,252
16,034	564	26,027	22,226	.....	203,548	.....	395,824	1,476,468	.....	36,252
210,771	3,269	5,838,612	35,884	282,531	.....	.....	600,539,053	.....	75,377,897	31,927,736
69,423	1,220	348,525	128,650	34,751	.....	1,170	2,806,193	4,943,945	.....	253,649
16,424	.....	135,198	1,579	.....	.....	.....	.....	.....	10,056,413	2,365,008
13,343	.....	64,008	12,698	.....	.....	.....	.....	90,064	.....	23,650
944,173	100,333	17,583,360	215,194	678,290	6,508,897	.....	1,954,411,658	.....	351,044,447	42,124,831
287,817	20,604	1,431,987	1,030,866	66,412	249,432	27,641	10,353,034	26,751,585	.....	368,779

Table 38.—Power Employed in the Mineral Industry in Canada, by Provinces, 1929, with Comparative Totals for 1928

Province	Steam engines and turbines	Internal combustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
Nova Scotia.....No.	102	61	3	166	233	399	341	574	157
H.P.	59,235	4,114	585	63,934	7,220	71,154	34,927	42,147	38,637
New Brunswick.....No.	42	39		81	29	110	39	68	33
H.P.	2,439	543		2,982	634	3,616	800	1,434	2,218
Quebec.....No.	64	66	15	145	2,229	2,374	119	2,348	121
H.P.	3,465	2,359	51,835	67,659	106,441	164,100	3,943	110,334	7,694
Ontario.....No.	220	257	16	493	4,275	4,768	193	4,468	256
H.P.	16,118	8,481	5,308	29,907	209,489	239,396	5,233	214,722	26,765
Manitoba.....No.	19	12		31	268	299	13	281	21
H.P.	995	1,097		2,092	9,591	11,683	385	9,976	1,450
Saskatchewan.....No.	46	5		51	9	60	34	43	30
H.P.	2,932	278		3,210	92	3,302	620	712	3,058
Alberta.....No.	352	97		449	793	1,242	387	1,180	316
H.P.	41,262	2,196		43,458	28,956	72,414	10,383	39,339	37,285
British Columbia...No.	159	136	75	370	2,736	3,106	914	3,650	173
H.P.	39,149	9,223	43,476	91,848	161,009	252,857	36,182	197,191	28,022
Yukon.....No.		11	2	13		13	29	29	3
H.P.		810	10,000	10,810		10,810	439	439	165
Canada, 1929.....No.	1,004	684	111	1,799	10,572	12,371	2,069	12,641	1,110
H.P.	165,595	29,101	111,204	305,900	523,432	829,332	92,912	616,344	145,294
Canada, 1928.....No.	1,039	619	145	1,803	9,392	11,195	1,973	11,365	1,173
H.P.	162,557	22,126	105,817	290,500	456,203	746,703	97,162	553,365	153,590

Table 39.—Power Employed in the Mineral Industry in Canada by Industries, 1929, with Comparative Totals for 1928

Industry	Steam engines and turbines	Internal combustion engines	Hydraulic turbines or water wheels	Total primary power	Electric motors run by purchased power	Total power employed	Electric motors run by primary power in same plant	Total electric motors	Boilers
METAL MINING—									
Alluvial Gold.....No.	2	11	6	19	1	20		1	1
H.P.	60	167	10,105	10,332	5	10,337		5	20
Auriferous Quartz.No.	30	68	15	113	1,299	1,412	144	1,443	92
H.P.	1,795	7,097	4,942	13,834	65,216	79,050	4,713	69,929	7,072
Copper-Gold-Silver									
No.	10	42	17	69	532	601	120	652	27
H.P.	548	2,205	10,575	13,328	25,728	39,056	5,767	31,495	2,161
Silver-Cobalt.....No.	4			4	167	171		167	15
H.P.	360			360	6,777	7,137		6,777	1,255
Silver-Lead-Zinc.No.	24	77	24	125	479	604	136	615	29
H.P.	7,420	5,891	3,119	16,430	15,678	32,108	3,146	18,824	4,511
Nickel-Copper.....No.					257	257		257	2
H.P.					24,111	24,111		24,111	100
Miscellaneous.....No.		1		1					3
H.P.		110		110		110			105
Non-Ferrous Smelting and Refining...No.	26	7	21	54	3,228	3,282	436	3,064	43
H.P.	13,186	220	65,160	78,566	180,282	258,848	12,820	193,102	14,622
Total.....No.	96	206	83	385	5,963	6,348	836	6,799	212
H.P.	23,369	15,690	93,901	132,960	317,797	450,757	26,446	344,243	29,846
NON-METAL MINING INCLUDING FUELS—									
<i>Fuels</i>									
Coal.....No.	457	47	2	506	811	1,317	882	1,693	433
H.P.	113,741	380	12,000	126,121	27,336	153,457	57,369	84,705	78,617
Natural Gas.....No.	6	135		141	6	147	14	20	9
H.P.	170	2,352		2,522	33	2,555	208	241	310
Petroleum.....No.	108	66		174	69	243	27	96	115
H.P.	6,233	1,839		8,072	581	8,653	467	1,048	8,709
Total.....No.	571	248	2	821	886	1,707	923	1,809	557
H.P.	120,144	4,571	12,000	136,715	27,950	164,665	58,044	85,994	87,636
<i>Other Non-Metal Mining</i>									
Abrasives.....No.	11	2		13	1	14	6	7	4
H.P.	495	70		565	10	575	220	250	342
Asbestos.....No.	5	1		6	573	579		573	10
H.P.	1,120	6		1,126	37,604	38,730		37,604	1,315
Feldspar.....No.	8			8		16			7
H.P.	117	159		276		276			242
Gypsum.....No.	10	57		67	175	242	13	188	14
H.P.	1,021	3,248		4,269	6,406	10,675	505	6,911	1,180
Iron Oxides.....No.					5	5		5	1
H.P.					118	118		118	15
Mica.....No.			1	1		1			2
H.P.			145	145		145			80
Quartz.....No.	10	4		14	10	24		10	8
H.P.	407	231		638	587	1,225		587	707
Salt.....No.	8	2		10	32	42	103	135	13
H.P.	185	330		515	422	937	1,151	1,673	3,260
Talc and Soap-stone.....No.					19	19		19	1
H.P.					695	695		695	80
Miscellaneous.....No.	6	9	1	16	13	29	11	24	18
H.P.	260	330	100	690	695	1,385	97	792	435
Total.....No.	58	83	2	143	828	971	133	961	78
H.P.	3,605	4,374	245	8,224	46,537	54,761	1,973	48,510	7,656
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—									
Cement.....No.	2	8	9	19	1,194	1,213	70	1,264	19
H.P.	2,000	278	4,000	6,278	72,454	78,732	2,800	75,254	3,647
Clay Products.....No.	88	42		130	569	699	21	590	161
H.P.	7,424	1,110		8,534	19,823	28,357	497	20,320	8,925
Lime.....No.	12	6	1	19	237	256	31	268	10
H.P.	570	130	20	720	11,477	12,197	575	12,062	898
Sand and Gravel.....No.	45	23	5	73	87	160	10	97	35
H.P.	2,691	662	350	3,703	2,705	6,408	328	3,033	1,610
Stone.....No.	132	68	9	209	808	1,017	45	853	98
H.P.	5,792	2,286	688	8,766	24,689	33,455	2,249	26,938	5,076
Total.....No.	279	147	24	450	2,895	3,345	177	3,072	263
H.P.	18,477	4,466	5,058	28,001	131,148	159,149	6,449	137,597	20,156
Grand total 1929.....No.	1,004	684	111	1,799	10,572	12,371	2,069	12,641	1,110
H.P.	165,595	29,101	111,204	305,900	523,432	829,332	92,912	616,344	145,294
Grand total 1928.....No.	1,039	619	145	1,803	9,392	11,195	1,973	11,365	1,173
H.P.	162,557	22,126	105,817	290,500	456,203	746,703	97,162	553,365	153,590

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929

Classification	1928		1929	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—				
Iron ore..... tons	2,222,897	4,325,159	2,447,807	5,026,265
Pigs, Ingots, Blooms and Billets—				
Pig iron..... tons	48,504	791,733	36,454	624,891
Ferro-silicon and ferro-manganese..... cwt.	127,606	485,740	183,176	587,152
Billets, not less than 60 lb. per lineal yard..... cwt.	521,959	812,585	401,470	691,742
Other pigs, ingots, blooms and billets..... cwt.	427,000	886,851	409,011	925,043
Total pigs, ingots, blooms and billets..... \$		2,976,909		2,828,828
Scrap iron or steel..... tons				
	152,973	1,675,475	121,294	1,367,179
Castings and Forgings—				
Axles, parts and blanks..... \$		1,516,504		1,393,631
Locomotive and car wheel tires..... cwt.	201,719	898,920	226,797	1,013,195
Other castings and forgings..... \$		3,385,236		3,386,452
Total castings and forgings..... \$		5,800,660		5,823,278
Rolling Mill Products—				
Band and hoop..... cwt.	1,304,492	4,457,155	1,499,337	5,204,502
Bars and Rails—				
Railway rails..... tons	31,181	974,866	28,379	944,965
Other bars and rails..... cwt.	3,435,030	8,944,679	3,568,402	9,376,514
Plates and Sheets—				
Boiler plate..... cwt.	229,345	541,404	239,293	614,819
Canada plates..... cwt.	207,696	773,325	135,232	504,017
Tinned plates..... cwt.	1,483,875	7,432,065	1,645,766	8,200,692
Plates not less than 30 in. by ½ in., n.o.p..... cwt.	1,461,437	2,773,984	2,102,547	3,993,352
Sheets, No. 14 gauge and thinner, n.o.p..... cwt.	1,514,277	5,141,842	1,633,126	5,733,489
Galvanized, flat..... cwt.	640,999	2,424,487	670,823	2,549,090
Galvanized, other..... cwt.	4,380	15,967	3,515	11,399
Skelp, for pipe, etc..... cwt.	3,265,785	6,034,182	3,135,813	5,890,497
Other plates and sheets..... cwt.	1,388,469	3,197,806	1,996,378	4,762,376
Rods..... cwt.	1,044,375	1,543,172	999,991	1,663,801
Flat eye-bar blanks..... tons	109	4,213	287	11,295
Bridges..... \$		136,744		179,293
Other structural iron..... cwt.	5,403,700	10,438,621	7,608,060	15,106,537
Total rolling mill products..... \$		54,834,512		64,746,638
Tubes, Pipes and Fittings—				
Boiler tubes..... \$		1,073,174		1,164,570
Cast iron pipe..... cwt.	125,880	218,377	101,260	209,703
Seamless tubing, not less ¾ c. per lb..... cwt.	78,002	532,846	102,635	749,349
Other tubes, pipes, etc..... \$		2,503,062		3,899,866
Total tubes, pipes and fittings..... \$		4,327,459		6,023,488
Wire—				
Barbed fencing..... cwt.	102,994	326,428	94,781	297,883
Galvanized, No. 9, 12 and 13 gauge, not telegraph or telephone..... cwt.	219,366	574,315	141,996	360,178
Steel wire for rope..... cwt.	146,506	901,275	180,006	1,134,313
Wire rope, twisted wire, clothes lines, wire cable, etc., n.o.p..... \$		346,081		490,577
Other..... \$		1,484,717		1,545,435
Total wire..... \$		3,632,816		3,828,386
Chains..... \$				
		863,196		1,043,015
Engines and Boilers—				
Engines, automobile..... No.	117,007	11,503,741	88,841	9,183,357
Engines, internal combustion, other..... No.	16,719	2,497,101	14,704	2,315,831
Locomotives and parts..... No.	189	1,136,644	214	773,807
Other boilers, engines, etc..... \$		3,268,795		5,501,354
Total engines and boilers..... \$		18,406,281		17,774,349
Farm Implements and Machinery—				
Cream separators..... No.	20,575	878,006	18,269	793,338
Other dairy machinery..... \$		222,174		231,705
Harvesters..... No.	7,573	2,008,141	5,286	5,016,421
Other harvesting implements and machinery..... \$		535,845		441,172
Planting and Tillage—				
Drills and parts..... No.	6,256	839,587	6,327	986,456
Ploughs and parts..... \$		2,037,884		2,228,598
Other planting..... \$		1,034,852		1,085,506

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification	1928		1929	
	Quantity	Value \$	Quantity	Value \$
IRON AND ITS PRODUCTS—Concluded				
Farm Implements and Machinery—Concluded				
Seed Separation—				
Threshing machine separators..... No.	7,760	8,214,938	1,988	2,160,705
Threshing machine separator parts..... \$		1,164,128		634,379
Fanning mills..... No.	2,717	73,502	1,321	30,616
Traction engines for farm purposes—				
Not over \$1,400 each..... No.	21,131	18,640,776	16,690	13,970,943
Other..... No.	316	645,516	283	547,094
Farm tractor parts and repairs..... \$		1,842,396		2,271,479
Other farm implements..... \$		1,755,745		1,446,914
Total farm implements and machinery..... \$		30,893,490		31,845,326
Hardware and Cutlery—				
Cutlery..... \$		1,742,346		1,652,191
Hardware—				
Nails, wire..... cwt.	14,506	48,035	13,002	46,985
Other nails, spikes, tacks..... \$		39,770		78,403
Needles and pins..... \$		456,788		520,699
Nuts and bolts..... cwt.	46,322	508,683	52,334	578,066
Screws..... \$		151,888		251,471
Other hardware..... \$		1,622,477		1,935,348
Total hardware and cutlery..... \$		4,569,987		5,113,163
Machinery (Except Agricultural)—				
Sewing machines..... No.	25,821	762,859	23,285	708,745
Sewing machine parts and attachments..... \$		478,666		477,216
Washing machines, domestic..... No.	23,427	1,561,547	24,746	1,701,999
Other household machinery..... \$		216,166		309,287
Rock drills..... No.	509	616,169	1,072	864,911
Other mining and metallurgical..... \$		4,084,346		9,935,397
Office or Business—				
Adding..... No.	10,781	1,227,285	8,732	1,257,536
Typewriting..... No.	19,021	1,027,847	21,336	1,062,329
Other..... \$		690,171		799,590
Printing and Book-Binding—				
Printing presses..... \$		3,098,798		2,597,365
Typesetting machines..... \$		1,091,786		1,139,559
Other printing and bookbinding..... \$		1,035,876		1,027,573
Coke and gas machinery..... \$		691,970		393,580
Cranes and derricks..... No.	337	1,385,011	477	1,669,918
Logging equipment..... \$		1,410,883		1,458,092
Metal-working, n.o.p..... \$		4,449,849		5,112,082
Paper and pulp mill..... \$		2,399,212		1,460,640
Pumps, power, and parts..... No.	8,817	1,095,037	10,476	1,758,110
Rolling mill machines..... \$		255,151		1,050,618
Shovels, steam, electric or other power..... No.	165	1,495,828	184	1,810,461
Textile..... \$		4,690,356		6,646,316
Other machinery..... \$		23,377,638		26,333,265
Total machinery (except agricultural)..... \$		57,142,451		69,574,589
Springs..... \$		238,060		313,359
Stamped and Coated Products—				
Tin cans..... \$		518,047		644,075
Other..... \$		1,842,751		1,986,528
Tools and hand implements..... \$		2,971,011		3,381,654
Vehicles—				
Automobiles, freight..... No.	7,182	8,305,235	5,278	6,817,176
Automobiles, passenger..... No.	40,226	32,527,641	39,446	32,605,958
Automobile parts..... \$		48,839,955		44,772,091
Railway cars, all kinds..... No.	1,247	960,332	1,129	805,976
Railway cars, parts of..... \$		965,590		2,046,615
Other vehicles of iron..... \$		1,870,486		2,163,148
Total vehicles..... \$		93,469,239		89,210,964
Drums, tanks, cylinders..... \$		1,380,998		1,791,942
Furniture..... \$		1,175,627		1,551,060
Plates for agricultural implements..... cwt.	37,174	179,092	10,588	45,894
Pumps, hand..... No.	54,058	552,348	59,858	592,384
Stoves..... \$		886,611		837,471
Valves..... \$		849,764		1,364,147
Articles for shipbuilding..... \$		1,480,077		2,336,040
Other iron and steel..... \$		18,971,590		23,430,405
Total iron and its products..... \$		322,963,610		342,480,427

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification	1928		1929	
	Quantity	Value	Quantity	Value
NON-FERROUS METALS—		\$		\$
Alumina and bauxite.....	cwt. 3,275,154	4,336,782	2,853,874	3,227,754
Cryolite.....	cwt. 69,265	297,629	48,019	194,638
Aluminium ingots, sheets.....	lb. 1,396,210	415,809	1,552,048	471,427
Other aluminium.....	\$	1,674,908		2,143,475
Brass—				
Scrap.....	cwt. 33,957	356,000	47,802	617,492
Bars and rods.....	cwt. 7,732	142,150	10,217	202,910
Strips, sheets, plates.....	cwt. 14,165	264,551	11,053	265,925
Tubing.....	lb. 3,322,210	748,869	4,074,669	1,020,931
Wire, plain.....	lb. 393,204	98,658	471,797	138,000
Wire cloth.....	\$	53,463		63,895
Other.....	\$	4,477,291		5,046,927
Total brass.....	\$	6,140,982		7,356,080
Copper—				
Blocks, pigs, ingots.....	lb. 7,883,600	1,176,941	12,084,000	2,246,600
Scrap.....	cwt. 56,063	785,141	49,583	827,832
Bars and rods.....	cwt. 366,027	5,639,888	555,438	10,086,738
Strips, sheets, plates.....	cwt. 25,867	521,559	28,063	698,974
Tubing.....	lb. 2,549,901	602,730	2,662,706	721,369
Other.....	\$	2,005,099		2,438,281
Total copper.....	\$	10,731,358		17,019,794
Lead—				
Pigs, bars and sheets.....	lb. 577,920	36,646	1,423,840	84,922
Other.....	\$	365,664		301,893
Nickel—				
Bars, rods, sheets, etc.....	lb. 730,106	240,378	1,243,865	388,296
Nickel-plated ware.....	\$	2,536,559		3,319,624
Other.....	\$	571,660		782,345
Precious Metals—				
Electro-plated ware.....	\$	1,282,513		1,410,202
Silver in bars, blocks, etc.....	\$	984,547		958,312
Other.....	\$	751,391		877,327
Tin—				
Blocks, bars, pigs.....	cwt. 53,587	2,822,413	57,145	2,670,819
Foil.....	lb. 102,388	61,127	102,152	55,092
Other (collapsible tubes).....	\$	44,655		49,841
Zinc—				
Spelter.....	lb. 1,845,258	107,920	2,658,483	165,566
Sheets and plates.....	lb. 9,295,469	686,899	10,628,131	787,152
Other.....	\$	214,371		206,966
Phosphor tin and bronze.....	lb. 772,565	299,578	841,824	340,660
Other alloys, n.o.p.....	\$	47,145		50,186
Clocks and watches.....	\$	3,540,106		3,608,898
Electric Apparatus—				
Batteries, storage.....	No. 33,278	598,754	23,369	573,295
Dynamos, generators.....	\$	1,441,735		2,093,353
Incandescent lamps—				
Carbon filament.....	No. 1,239,055	64,594	1,403,651	131,070
Metal filament.....	No. 1,770,970	138,244	695,928	87,902
Electric light fixtures.....	\$	1,008,982		1,217,435
Meters.....	\$	396,900		399,267
Motors.....	\$	3,826,102		4,944,231
Spark plugs, etc.....	\$	875,831		1,280,590
Switches, etc.....	\$	1,571,622		2,236,688
Telegraph instruments.....	\$	388,717		787,994
Telephone instruments.....	\$	1,488,427		2,551,588
Wireless apparatus.....	\$	5,090,239		10,198,060
Other.....	\$	7,015,182		10,338,060
Total electric apparatus.....	\$	23,905,429		36,839,533
Gas apparatus.....	\$	253,081		298,289
Printing materials (except machinery)—				
Stereotypes.....	sq. in. 6,313,103	320,332	6,105,678	351,776
Other.....	\$	130,942		123,828
Manganese oxide.....	cwt. 2,128,861	1,058,821	1,982,782	990,608
Ores, n.o.p.....	cwt. 751,177	826,278	208,919	358,639
Antimony, not ground.....	lb. 1,529,823	140,958	1,746,525	147,643
Mercury.....	lb. 199,603	269,746	346,701	478,048
Lamps, sidelights, etc.....	\$	1,389,745		1,737,881
Other non-ferrous metals.....	\$	2,453,007		2,888,760
Total non-ferrous metals.....	\$	68,939,379		90,686,274

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification	1928		1929	
	Quantity	Value	Quantity	Value
		\$		\$
Non-Metallic Minerals—				
Asbestos other than crude.....	\$	835,887		1,013,436
Clay and Clay Products—				
China clay.....	cwt.	462,357	497,571	292,980
Fireclay.....	cwt.	1,219,155	1,521,282	322,508
Other clays.....	\$	96,907		167,641
Bricks, building.....	M	14,513	15,678	291,370
Bricks, fire.....	\$	1,829,380		2,565,114
Brick and tile, n.o.p.....	\$	886,796		1,240,131
Pottery and chinaware.....	\$	4,782,242		5,484,104
Artificial teeth.....	\$	445,609		461,832
Bath tubs, etc.....	\$	573,604		638,874
Other.....	\$	633,959		695,012
Total clay and clay products.....	\$	10,023,747		12,159,566
Coal and Coal Products—				
Coal, anthracite.....	tons	3,748,816	4,019,917	28,809,792
Coal, bituminous.....	tons	12,761,484	13,707,543	26,259,704
Coal for ships' stores.....	tons	684,461	462,595	881,264
Coal tar, crude.....	gal.	6,003,182	6,429,566	518,878
Carbolic oil.....	gal.	1,803,659	2,398,042	445,321
Coke.....	tons	1,060,029	1,226,853	6,659,514
Lignite and coal products, n.o.p.....	\$	69,436		77,852
Total coal and coal products.....	\$	61,251,395		63,652,325
Glass and Glassware—				
Carboys, bottles, jars, etc. (including milk bottles). ..	\$	1,509,584		1,714,746
Tableware.....	\$	1,041,826		1,110,456
Incandescent lamp bulbs and tubing for.....	\$	563,147		\$ 595,113
Common window glass.....	sq. ft.	45,509,833	51,389,896	1,550,939
Plate glass—				
Not over 7 sq. ft.....	sq. ft.	4,743,644	5,004,282	1,433,703
7 to 25 sq. ft.....	sq. ft.	944,562	1,060,294	383,250
Other, not bevelled.....	sq. ft.	1,338,273	1,600,167	628,166
Other glass and glassware.....	\$	2,789,574		3,153,084
Total glass and glassware.....	\$	9,294,095		10,569,457
Graphite and products.....	\$	128,026		155,770
Petroleum, Asphalt and Their Products—				
Asphalt, solid.....	cwt.	959,811	1,075,002	829,328
Other asphalt and oil.....	\$	142,452		123,152
Crude Petroleum—				
Natural, for refining.....	gal.	853,889,703	1,060,000,971	46,154,347
Other, for refining.....	gal.	263,771	5,726,147	376,001
Other, -8235 and heavier.....	gal.	62,680,093	63,264,841	2,444,259
Fuel oil for ships' stores.....	gal.	32,539,383	981,622	868,925
Coal and kerosene oil, refined.....	gal.	3,964,692	4,523,347	399,724
Gasoline—				
Under .725 specific gravity.....	gal.	116,062,590	135,558,699	15,096,277
Other.....	gal.	27,590,526	39,592,871	4,707,809
Lubricating oil.....	gal.	15,487,945	17,404,194	5,444,947
Other oils.....	\$	239,503		242,537
Other petroleum products.....	\$	1,062,824		1,152,104
Total petroleum, asphalt and their products.....	\$	62,634,866		77,839,410
Stone and Its Products—				
Abrasives.....	\$	4,129,225		4,508,916
Building and paving stone.....	\$	672,245		894,118
Cement.....	cwt.	119,166	195,929	189,169
Silica sand.....	cwt.	3,087,676	4,679,252	490,558
Whiting.....	cwt.	342,034	350,098	203,035
Marble, slate and other.....	\$	2,356,480		2,774,122
Total stone and its products.....	\$	7,837,212		9,059,918
Miscellaneous—				
Carbons, electric.....	\$	480,334		473,383
Diamonds, unset.....	\$	3,402,993		3,633,830
Insulators, electric.....	\$	429,529		465,578
Salt.....	cwt.	3,780,510	3,531,300	936,820
Sulphur.....	cwt.	3,646,860	4,698,520	3,789,243
Other non-metallic minerals.....	\$	1,768,440		2,173,063
Total non-metallic minerals.....	\$	162,172,427		185,921,799

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Concluded

Classification	1928		1929	
	Quantity	Value \$	Quantity	Value \$
CHEMICALS AND ALLIED PRODUCTS—				
Acid, citric..... lb.	351,385	152,930	322,494	150,497
Acid, stearic..... lb.	1,536,832	168,370	2,166,794	275,818
Other acids..... \$		683,718		804,984
Alcohols, industrial..... gal.	9,479	20,809	38,651	66,392
Cellulose products..... \$		2,519,085		2,775,840
Drugs and medicinal preparations..... \$		3,715,028		3,730,193
Dyeing and Tanning Materials—				
Aniline and coal tar dyes..... lb.	3,080,740	1,775,977	3,015,457	1,811,748
Coal tar dye products, n.o.p..... lb.	571,487	117,932	923,261	167,214
Logwood, oak, quebracho extracts..... lb.	44,198,159	1,725,895	31,077,418	1,191,386
Other dyeing and tanning articles..... \$		473,777		475,320
Total dyeing and tanning materials..... \$		4,093,581		3,645,668
Explosives..... \$				
		606,713		587,311
Fertilizers, n.o.p.—				
Potash, muriate of..... cwt.	477,101	842,988	340,024	611,121
Soda nitrate..... cwt.	535,606	1,204,017	677,558	1,419,647
Superphosphates..... cwt.	1,949,789	1,188,537	1,958,501	1,147,839
Other..... \$		1,784,299		1,433,116
Total fertilizers, n.o.p..... \$		5,019,841		4,611,723
Paints, Pigments and Varnishes—				
Litharge..... cwt.	39,773	279,136	55,922	423,261
Lead, red..... lb.	1,469,943	100,733	1,791,872	134,685
Black, carbon..... lb.	12,940,270	853,230	14,620,572	1,014,140
Blacks, other..... lb.	1,815,546	132,543	1,444,378	111,466
Lithopone..... lb.	16,287,132	177,207	19,408,436	852,079
Oxide of cobalt, etc..... lb.	266,749	133,818	288,694	124,748
Oxides, fireproofs..... lb.	6,969,104	709,539	7,365,868	790,654
Zinc white..... lb.	18,128,357	1,166,491	19,052,472	1,248,668
Liquid fillers, etc..... gal.		579,877	495,436	635,735
Varnish, lacquers, etc..... gal.	137,727	246,120	144,369	259,765
Other paints, etc..... \$		630,787		625,959
Total paints, pigments and varnishes..... \$		5,549,481		6,221,160
Perfumery, Cosmetics—				
Perfumes over 4 oz..... gal.	2,914	124,023	2,693	109,167
Other..... \$		1,278,816		1,388,371
Soap—				
Castile..... lb.	1,221,382	98,322	1,237,860	93,264
Common laundry..... lb.	9,320,902	697,584	11,485,386	860,509
Other..... \$		371,004		352,415
Inorganic Chemicals, n.o.p.—				
Alum in bulk..... cwt.	40,310	57,332	34,296	47,070
Sulphate of alumina..... cwt.	441,244	521,903	522,966	611,244
Ammonia, nitrate of..... lb.	3,873,554	147,924	4,989,868	187,433
Sal ammoniac..... lb.	3,615,678	143,701	3,455,465	135,585
Copper sulphate..... lb.	5,369,045	274,645	4,370,426	236,693
Chlorine, liquid..... lb.	5,327,349	186,734	7,042,430	210,128
Chloride of lime..... lb.	12,782,907	202,674	7,862,413	123,427
Potash compounds..... lb.	4,459,110	465,353	6,189,559	561,714
Soda compounds..... lb.	272,405,089	3,465,965	374,894,378	4,508,244
Acid phosphate..... lb.	3,263,291	245,518	2,982,679	223,157
Other..... \$		1,086,542		1,454,915
Total inorganic chemicals, n.o.p..... \$		6,798,291		8,299,610
Other Drugs, Dyes and Chemicals—				
Glycerine..... lb.	5,702,244	597,982	8,328,212	736,747
Other chemicals and allied products..... \$		4,468,116		5,421,509
Total chemicals and allied products..... \$		36,963,694		40,131,178

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929

Classification		1928		1929	
		Quantity	Value	Quantity	Value
			\$		\$
IRON AND ITS PRODUCTS—					
Ore, including chromite.....	tons	2,615	12,500	3,859	19,461
Pigs, ingots, blooms and Billets—					
Pig Iron.....	tons	1,168	20,642	8,375	151,967
Ferro-manganese and ferro-silicon.....	tons	43,830	3,071,567	69,099	4,816,930
Billets, ingots and blooms.....	tons	1,304	30,949	520	14,558
Total pigs, ingots, blooms and billets.....	\$		3,123,158		4,983,455
Scrap iron.....	tons	86,687	954,363	138,372	1,583,830
Castings.....	\$		84,905		260,049
Forgings.....	\$		4,483		2,767
Rolling Mill Products—					
Bars and rods.....	tons	25,917	870,390	15,312	599,489
Plates and sheets.....	tons	216	13,625	138	12,014
Rails.....	tons	6,632	220,093	19,678	659,940
Structural steel.....	tons	278	31,305	812	115,699
Total rolling mill products.....	\$		1,135,413		1,387,142
Pipe and Tubing.....	\$		1,845,010		2,567,033
Wire—					
Barbed.....	cwt.	30,701	103,182	31,236	110,385
Woven fencing.....	\$		118,129		127,879
Other.....	\$		699,850		738,356
Engines and Boilers—					
Locomotives and parts.....	No.	2	77,667	2	114,913
Other.....	\$		177,456		273,105
Farm Implements and Machinery—					
Cream separators.....	\$		44,709		54,692
*Milking machines and parts.....	No.		231,997		696,730
Harvesters.....	No.	9,756	1,705,539	14,348	2,455,601
Hay rakes.....	No.	2,628	88,778	4,994	189,190
Mowers.....	No.	10,950	658,296	13,142	788,247
Reapers.....	No.	1,882	172,471	393	29,584
*Reaper threshers.....	No.	1,721	1,610,975	3,263	3,532,678
Cultivators.....	No.	15,921	932,240	17,529	625,348
Drills.....	No.	5,687	949,846	5,945	980,675
Harrows.....	\$		450,574		610,754
Ploughs.....	\$		2,739,923		4,821,266
Threshing machines.....	\$		472,304		572,046
Spades and shovels.....	\$		321,561		216,584
Other.....	\$		691,260		959,742
Parts.....	\$		3,385,285		3,302,609
Total farm implements and machinery.....	\$		14,455,728		19,835,746
Hardware and Cutlery—					
Razors and razor blades.....	\$		904,782		563,174
Nails, wire.....	cwt.	75,266	260,540	60,166	211,265
Nails, other.....	cwt.	18,414	133,690	23,821	145,169
Needles and pins.....	\$		567,286		525,157
Bolts and nuts.....	cwt.	9,611	63,900	9,792	68,200
Other hardware.....	\$		259,896		303,561
Machinery—					
Electric vacuum cleaners.....	No.	39,462	1,660,809	44,956	1,909,921
Sewing machines.....	\$		4,468,956		3,452,283
Adding machines.....	No.	3,839	397,689	4,164	408,645
Typewriters.....	No.	1,067	48,075	1,384	78,120
Metal-working.....	\$		263,120		70,352
Wood-working.....	\$		21,262		63,976
Other machinery.....	\$		712,018		1,162,787
Total machinery.....	\$		7,571,929		7,146,084
Axes*.....	doz.	3,905	33,756	4,304	36,973
Tools, hand or machine.....	\$		239,370		253,818
Vehicles—					
Automobiles, freight—					
One ton or less.....	No.	19,921	7,038,401	25,040	9,749,435
Over one ton.....	No.	3,735	1,613,900	11,808	5,081,571
Automobiles, passenger—					
\$500 or less.....	No.	42,308	14,827,725	45,852	17,325,333
\$500 to \$1,000.....	No.	10,729	7,125,407	17,873	11,120,159
Over \$1,000.....	No.	2,695	3,270,882	1,138	1,378,941
Total automobiles.....	No.	79,388	33,876,315		44,655,439

*April 1st to December 31st, 1928.

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929—Continued

Classification	1928		1929	
	Quantity	Value	Quantity	Value
		\$		\$
IRON AND ITS PRODUCTS—Concluded				
Vehicles—Concluded				
Automobile parts.....	\$	2,152,166		2,350,232
Railway cars and parts.....	\$	283,101		32,337
Tractors and parts.....	No. 40	38,435	12	13,913
Other vehicles of iron.....	\$	110,465		102,444
Total vehicles.....	\$	36,460,482		47,154,365
Chains.....	\$	157,298		172,434
Stoves.....	\$	124,326		156,852
Other iron and steel.....	\$	1,096,578		1,360,392
Total iron and its products.....	\$	70,665,677		90,101,565
NON-FERROUS METALS—				
Aluminium—				
Scrap.....	cwt.	18,003	34,162	455,326
Bars, blocks, etc.....	cwt.	405,971	729,708	13,210,023
Manufactures.....	\$	759,258		1,479,160
Brass—				
Old and scrap.....	cwt.	115,482	119,185	1,206,510
Valves.....	\$	261,419		282,429
Other.....	\$	603,544		908,760
Copper—				
Fine, in ore, matte, regulus.....	cwt.	764,279	869,991	8,944,965
Blister.....	cwt.	1,047,647	1,482,785	26,711,867
Old and scrap.....	cwt.	80,617	115,596	1,574,712
Bars.....	cwt.	1,582	1,321	35,900
Wire, insulated.....	\$	259,430		119,030
Other.....	\$	25,930		13,522
Total copper.....	\$	23,595,415		37,399,996
Lead—				
In ore.....	cwt.	149,629	159,768	1,047,441
Pig.....	cwt.	2,554,217	2,283,741	10,053,402
Nickel—				
In matte.....	cwt.	363,708	296,307	4,501,389
Nickel oxide.....	cwt.	96,072	110,009	3,489,782
Fine.....	cwt.	511,887	684,082	17,544,513
Precious Metals—				
Gold-bearing quartz, dust, etc.....	\$	10,457,877		29,995,983
Silver in ore, concentrates, etc.....	oz.	6,815,691	7,058,275	3,736,204
Silver bullion.....	oz.	14,805,993	14,879,770	8,022,917
Other.....	\$	542,310		649,161
Total precious metals.....	\$	23,404,540		42,404,265
Zinc—				
Ore.....	tons	11,255	12,869	1,415,725
Spelter.....	tons	1,271,885	1,350,857	7,031,645
Scrap, dross and ashes.....	cwt.	69,440	76,382	262,719
Clocks and watches.....	\$			
Miscellaneous—				
Electric apparatus.....	\$	173,972		228,771
Cobalt ore.....	\$	2,218,616		2,643,526
Cobalt, metallic.....	\$	530,897		484,491
Ores, n.o.p.....	lb.	240,966	315,700	608,444
Other non-ferrous metals.....	tons	15	469	44,424
Total non-ferrous metals.....	\$	1,019,737		1,461,397
		163,411,613		148,164,138
NON-METALLIC MINERALS—				
Asbestos.....	tons	129,192	143,725	10,127,208
Asbestos sand.....	tons	135,729	148,305	2,507,474
Asbestos mfrs.....	\$	65,895		113,952
Porcelain insulators.....	\$	124,140		268,109
Other clay and products.....	\$	160,378		107,397
Coal (incl. lignite).....	tons	863,941	842,972	4,375,328

*1927—Zinc ore exported.

†1928—Zinc contained in ore exported.

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929—Concluded

Classification	1928		1929	
	Quantity	Value	Quantity	Value
		\$		\$
Non-Metallic Minerals—Con.				
Coal Products—				
Cinders.....	\$	11,713		2,516
Coke..... tons	44,915	625,862	53,130	732,489
Tar..... gal.	3,572,781	311,031	3,069,247	140,541
Glass and glassware.....	\$	150,265		100,507
Graphite..... cwt.	21,065	45,384	31,643	88,647
Mica splittings..... cwt.	1,679	80,902	1,822	96,726
Other mica..... \$		94,859		116,333
Petroleum and its Products—				
Petroleum, crude..... gal.	21,531,929	1,098,586	28,177,495	1,548,288
Kerosene, refined..... gal.	1,297,081	127,391	1,367,241	137,160
Gasoline and naphtha..... gal.	3,957,557	686,256	4,669,078	875,027
Other oil..... gal.	279,946	85,014	433,634	105,426
Wax..... cwt.	10,010	54,501	11,556	62,171
Stone and its Products—				
Abrasives, artificial..... cwt.	1,235,302	3,295,460	1,571,816	3,815,804
Grindstones..... \$		28,747		36,536
Gypsum, crude..... tons	824,536	1,240,987	893,445	1,086,939
Lime..... cwt.	400,852	357,085	484,769	428,209
Cement, portland..... cwt.	935,638	340,624	819,389	252,955
Feldspar..... tons	28,101	230,945	29,896	242,915
Sand and gravel..... tons	797,111	232,422	1,903,312	441,798
Talc, refined..... cwt.	218,915	133,601	227,988	139,096
Other..... \$		506,122		564,765
Other non-metallic minerals..... \$		856,964		1,045,137
Total non-metallic minerals..... \$		26,395,420		29,559,453
CHEMICALS AND ALLIED PRODUCTS—				
Acid, sulphuric..... cwt.	266,586	152,544	167,938	91,634
Acids, other..... cwt.	417,224	3,938,879	583,682	4,782,526
Wood alcohol..... gal.	27,380	23,514	31,193	30,092
Other industrial spirits..... \$		21,090		7,964
Drugs, medicinal..... \$		590,049		808,981
Dyeing and tanning materials..... \$		1,192		486
Explosives..... \$		218,324		235,132
Fertilizers—				
Ammonium sulphate..... cwt.	272,637	561,696	489,782	909,510
Cyanamid..... cwt.	2,710,526	4,759,810	3,858,586	6,436,519
Other mfd., n.o.p..... cwt.	45,710	49,330	85,782	106,695
Paints, pigments and varnishes..... \$		502,970		490,426
Soap, toilet..... lb.	4,996,008	662,975	5,253,717	720,743
Soap, n.o.p..... lb.	416,405	33,539	490,584	37,813
Inorganic Chemicals, n.o.p.—				
Arsenic, n.o.p..... cwt.	31,949	122,106	31,673	123,398
Acetate of lime..... cwt.	99,365	356,845	83,987	366,815
Calcium carbide.....		837,912		684,900
Soda and sodium compounds..... cwt.	639,294	3,711,376	943,504	4,256,621
Cobalt oxide and salts..... lb.	369,783	650,981	236,873	450,870
Other..... \$		134,151		101,457
Total inorganic chemicals, n.o.p..... \$		5,813,371		5,984,061
Creosote oil..... gal.				
Glycerine..... cwt.	1,150,766	188,191	1,025,223	130,543
Other drugs, dyes and chemicals..... \$	3,137	23,448	13,064	68,101
Total chemicals and allied products..... \$		1,003,914		1,117,013
Total chemicals and allied products..... \$		18,544,836		21,988,239

Table 41A.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1929.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
BRITISH EMPIRE	\$	\$	\$	\$	\$	\$	\$	\$
United Kingdom.....	22,272,090	7,841,850	7,103,049	15,328,746	13,207,944	2,170,488	5,502,453	4,729,616
Irish Free State.....	20,142	42,892	250	15,309	243	5,996		20,621
Aden.....		48,450						
Africa—								
British East.....		1,224,881		3,056		2,648	585	632
British South.....	19	5,901,472		354,335	20,506	92,870		40,116
British West—								
Gambia.....		20,642						
Gold Coast.....		522,758	918,448			264		1,373
Nigeria.....		156,967		314		10		280
Sierre Leone.....		37,969		50				
Other Br. W. Africa.....								30
Bermuda.....	10,632	38,364	550	4,442	93	32,435		34,498
Br. East Indies—								
British India.....	6,298	3,621,252	65,558	3,568,246	58,269	26,052	5,832	133,048
Ceylon.....	271	327,197	166	17,520		1,340		42,557
Straits Settlements.....		668,113	347,153	42,696		3,946		1,740
Other Br. East Indies.....		4,991						
British Guiana.....	50,940	86,296	89,452	18,571		43,682		55,308
British Honduras.....	1,260	17,370	163	1,074		6,859		7,706
British Sudan.....		70,225		4,350				
Br. West Indies—								
Barbados.....	14,781	61,411	4,330	3,509		19,947		93,423
Jamaica.....		522,413		8,012	1	6,912	11,871	64,493
Trinidad and Tobago.....	9,714	476,895		22,504		20,904		84,912
Other Br. West Indies.....	14,997	100,261	6,204	9,949	87,827	30,822	1,244	68,121
Gibraltar.....						8,010		
Hong Kong.....	1,326	140,460	1,647	7,639	6,447		90,612	104,249
Iraq (Mesopotamia).....		72,386						
Malta.....		167,213		568				
Newfoundland.....	811,313	1,600,762	3,966	185,730	193,826	1,973,226	251	572,460
Oceania—								
Australia.....	467	8,871,387	485	369,473	132	331,010	1,879	230,742
Fiji.....		107,160	302	1,674		1,880		267
New Zealand.....	141	9,245,195	376	937,453	140	267,609	5,874	174,231
Other Oceania.....		29,332		52				
Palestine.....	252	43,457	111	58	80	300	29	319
Total British Empire..	23,214,643	42,070,021	8,542,210	20,905,330	13,575,508	5,047,210	5,620,630	6,460,747
FOREIGN COUNTRIES								
Argentina.....	1,182	12,053,223	20	649,281		7,430	14,264	2,065
Austria.....	32,547	31,143	85,576	38,286	9,684		3,074	
Belgium.....	3,707,557	591,638	490,064	2,074,869	4,736,705	1,030,292	495,816	889
Bolivia.....		108,361		1,599				624
Brazil.....		2,499,316		532,864	445	51,947		4,596
Chile.....		1,824,564		61,095		5,347	606,337	11,459
China.....	5,811	362,477	67,081	4,352,453	10,598	42,464	25,553	129,076
Colombia.....		238,825		46,356	5,745,438	83,011		22,504
Costa Rica.....		34,045		1,498		814		4,056
Cuba.....		25,016		53,394		5,615		171,677
Czecho-Slovakia.....	73,011	35,931	87,233	10,186	957,515		22,721	
Denmark.....	22,663	215,350	9,100	82,257	8,383	26,363	5,888	155
Ecuador.....		87,821		413				
Egypt.....		605,435	51	328	35			1,414
Estonia.....		2,679						
Finland.....	25,342	36,944			31,026	80	5	
France.....	613,433	872,266	422,552	2,571,105	857,996	650,394	1,413,365	17,360
French Africa.....	10	622,744	20	125				
French West Indies.....		48,371		21		16,862		147
St. Pierre and Miquelon.....	630	51,812	231	4,720		82,659		9,449
Germany.....	3,421,559	1,207,406	1,444,510	7,225,348	1,440,072	1,316,435	2,910,027	8,953
Greece.....		50,598		4,086	59	8,097		67
Guatemala.....		72,818		1,902		5,739		
Hayti.....		62,340		934				207
Honduras.....		29,483						
Italy.....	18,712	162,360	85,499	454,152	267,058	14,185		45,358
Japan.....	14,451	627,216	230,742	8,752,793	532,734	260,753	125,664	180
Korea.....	578	9,739	1,090			572,034	117,336	758,313
Lettonia (Latvia).....		3,180						14,708
Mexico.....		78,871		571,903	220	21,377		1,403,930
Morocco.....		163,015		78				
Netherlands.....	131,879	250,158	84,113	4,340,866	744,549	161,907	1,007,156	1,524
Dutch East Indies.....		1,769,602		45,504		12,529		40,222
Dutch Guiana.....		2,414	28,135					1,142
Dutch West Indies.....		75,416		207	420,151			2,677

Table 41A.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1929.—Concluded.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
FOREIGN COUNTRIES—Con.	\$	\$	\$	\$	\$	\$	\$	\$
Norway.....	58,046	145,410	1,144	10,055	2,135	136,826	91	.....
Panama.....	.....	396,058	.....	273	.....	13,378	.....	5,004
Paraguay.....	.....	58,220	.....	.....	.....	.....	.....	.....
Persia.....	.....	147,824	134	.....	.....	.....	.....	355
Peru.....	5,467	787,580	.....	11,483	6,236,542	19,768	.....	18,021
Poland and Danzig.....	3,816	35,092	140	99,664	.....	6,502	.....	.....
Portugal.....	.....	292,733	.....	2,697	532	.....	.....	.....
Azores and Madeira.....	.....	2,067	.....	234	6	.....	.....	.....
Portuguese Africa.....	.....	299,008	.....	5,076	.....	3,126	.....	450,741
Roumania.....	.....	477,934	.....	3,913	25	.....	.....	350
Russia.....	.....	2,058,101	.....	139,137	692,691	.....	.....	31
San Domingo.....	.....	5,078	.....	9,540	.....	.....	.....	9,188
Siam.....	.....	181,060	.....	4,814	.....	.....	.....	.....
Spain.....	17,918	2,553,958	112,936	152,162	48,875	29,292	32,116	76,043
Sweden.....	1,519,742	371,462	215,851	134,006	38,846	39,067	34,239	.....
Switzerland.....	159,038	19,334	1,826,699	606,317	16,086	892	287,544	150
Syria.....	364	177,766	1,766	500	15	1,740	5,336	287
Turkey.....	.....	69,596	364	.....	30	4,352	.....	.....
United States.....	309,421,260	13,250,523	76,757,624	94,155,696	149,531,567	19,645,319	27,403,857	11,985,642
Alaska.....	.....	1,576	13,957	555	1,862	378,070	143	94
Hawaii.....	3,529	69	50	.....	100	15	.....	84
Philippine Islands.....	.....	124	.....	98	.....	15,470	.....	7,842
Porto Rico.....	.....	2,193	.....	.....	.....	25	.....	44,083
Uruguay.....	.....	462,859	.....	15,070	.....	.....	.....	1,942
Venezuela.....	.....	648,996	.....	21,195	.....	511	.....	103,134
Other Foreign Countries.....	88	674,336	177,382	7,700	14,311	2,049	16	11,176
Total Foreign Countries.....	319,265,784	48,031,544	82,144,064	127,258,808	172,346,291	24,672,786	34,510,548	15,366,949
Grand Total.....	342,480,427	90,101,565	90,686,274	148,164,138	185,921,799	29,719,996	40,131,178	21,827,696

UNITED STATES TARIFF RATES ON MINERAL PRODUCTS IMPORTED

Since Canadian producers of mineral products market a large part of their annual output in the United States it was thought it might be of value to readers of this report to have at hand a guide to *United States Tariff* and the following tables were therefore compiled. These have been checked by the *Customs Division* of the *United States Treasury Department* at Washington, D.C., U.S.A.

Table 42.—United States Tariff

U. S. Tariff Paragraph No.	Material	Duty
(a) On Metals and Manufactures of		
1508	Antimony ore.....	Free
1547	Chromite—Chromite or chrome ore.....	Free
1550	Cobalt metal and ore.....	Free
29	Cobalt linoleate.....	10c. per lb.
29	Cobalt, oxide of.....	20c. per lb.
29	Cobalt salts and compounds (all other).....	30% ad val.
29	Cobalt sulphate.....	10c. per lb.
1457	Cobalt ore waste.....	10% ad val.
1556	Copper ore, regulus of, and black or coarse copper, and cement copper, old copper, fit only for re-manufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs not manufactured or specially provided for.....	Free
1557	Copper sulphate or blue vitriol, copper acetate and subacetate.....	Free
331	Copper in rolls, rods or sheets.....	2½c. per lb.
	Engraver plates, not ground and seamless copper tubes and tubing.....	7c. per lb.
	Engravers plates, ground, and brazed copper tubes.....	11c. per lb.
	Brass rods, sheet brass, brass plates, bars, and strips, Muntz or yellow metal sheets, sheathing, bolts, piston rods and shafting.....	4c. per lb.
	Seamless brass tubes and tubing.....	8c. per lb.

Table 42.—United States Tariff—Continued

Item Number	Material	Duty
(a) On Metals and Manufactures of—Concluded		
	Brazed brass tubes, brass angles and channels.....	12c. per lb.
	Bronze rods and sheets.....	4c. per lb.
	Bronze tubes.....	8c. per lb.
1529	Bullion gold or silver.....	Free
1634	Gold ores and sweepings.....	Free
1597	Iron ore including manganese iron ore and residuum from burnt pyrites.....	Free
1677	Sulphur in any form, and sulphur ore, and spent oxide of iron containing more than 25 per centum of sulphur.....	Free
392	Lead bearing ores and mattes—duty applied on lead contents, such duty shall not be applied to the lead contained in copper mattes unless actually recovered.....	1½c. per lb.
393	Lead bullion or base bullion, lead in pigs and bars, dross, reclaimed lead, scrap lead, antimonial lead, antimonial scrap lead, type metal, Babbitt, solder and all other combinations not specially provided for, duty to apply on lead contents.....	2½c. per lb.
47	Lead in sheets, pipe, shot, glazier's lead and lead wire.....	2½c. per lb.
74	Lead, linoleate of.....	30% ad val.
302	Lead litharge.....	2½c. per lb.
	Manganese ore or concentrates containing in excess of 30 per centum of metallic manganese.....	1c. per lb. on metallic manganese content.
302	Molybdenum ore or concentrates.....	35c. per lb. on metallic molybdenum content.
302	Tungsten ore or concentrates.....	45c. per lb. on metallic tungsten content.
1634	Nickel mattes and ores of nickel.....	Free
390	Nickel oxide.....	1c. per lb.
390	Nickel and nickel alloys in pigs, ingots, shot, cubes and similar forms.....	3c. per lb.
390	Nickel in bars, rods, sheets, strips, tubing, etc.....	25% ad val.
390	In addition thereto on the foregoing if cold rolled, drawn or worked.....	10% ad val.
1596	Platinum, palladium and other metals of the platinum group.....	Free
1644	Zinc-bearing ore of all kinds containing less than 10 per centum of zinc.....	Free
394	Containing 10 per centum or more of zinc and less than 20 per centum.....	4c. per lb. on metallic zinc content.
	Containing more than 20 per centum of zinc and less than 25 per centum.....	1c. per lb. on metallic zinc content.
	Containing 25 per centum of zinc or over.....	1½c. per lb. on metallic zinc content.
395	Zinc in blocks, pigs or slabs and zinc dust.....	1½c. per lb.
395	Zinc in sheets.....	2c. per lb.
395	Zinc scrap for re-manufacturing.....	1½c. per lb.
(b) On Non-Metallic Minerals		
1619	Actinolite—crude, classified as "minerals, crude, not specially provided for".....	Free
214	Actinolite—ground, classified as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
1513	Arsenic—white or arsenious acid.....	Free
1512	Arsenic—Sulphide of.....	Free
379	Arsenic—Metallic.....	6c. per lb.
1515	Asbestos—crudes, fibres, sand.....	Free
1401	Asbestos—yarn.....	30% ad val.
69	Barytes—ore, crude.....	\$4 per ton
69	Barytes—ore, ground.....	\$7.50 per ton.
	Calcite—not mentioned by this name in the tariff. Chalk, crude, is free (Item 1545) and chalk, ground, is dutiable at 25% ad valorem (Item 20).....	
1570	Corundum—ore.....	Free
1415	Corundum—ground.....	1c. per lb.
1619	Feldspar—crude, classified as "minerals, crude not specially provided for".....	Free
214	Feldspar—ground, dutiable as "earthy or mineral substances, wholly or partly manufactured, not specially provided for".....	30% ad val.
207	Fluorspar.....	\$5.60 per ton
	Fluorspar—from Nov. 16, 1928 fluorspar containing not more than 93 per cent, calcium fluoride.....	
213	Graphite or plumbago—crude or refined—amorphous.....	\$8.40 per ton
213	Graphite or plumbago—crude or refined—crystalline lump, chip or dust.....	10% ad val.
213	Graphite or plumbago—crude or refined—crystalline flake.....	20% ad val.
236	Grindstones—finished or unfinished.....	1½c. per lb.
1643	Gypsum—crude.....	\$1.75 per ton
205	Gypsum—ground.....	Free
75	Iron oxides—ochres, crude.....	\$1.40 per ton
75	Iron oxides—ochres, washed or ground.....	1c. per lb.
75	Iron oxides—"iron-oxide pigments not specially provided for".....	1c. per lb.
1204	Magnesite—crude.....	20% ad val.
1204	Magnesite—caustic calcined.....	15% ad val.
204	Magnesite—dead burned and grain.....	1½c. per lb.
50	Magnesium sulphate—(Epsom salts).....	2½c. per lb.
208	Mica—unmanufactured, valued at not above 15 cents per pound.....	4c. per lb.
208	Mica—unmanufactured, valued above 15 cents per pound.....	25% ad val.
208	Mica—cut or trimmed, and mica splittings.....	30% ad val.
208	Mica—ground.....	20% ad val.
808	Mineral waters.....	10c. per gal.

Table 42.—United States Tariff—Concluded

Item Number	Material	Duty
(b) On Non-Metallic Minerals—Concluded		
1640	Phosphate—"phosphates, crude".....	Free
1677	Pyrites—"sulphur ore, such as pyrites or sulphuret of iron in its natural state, and spent oxide of iron, containing more than 25% of sulphur".....	Free
83	Salt—in bags, sacks, barrels, or other packages.....	11c. per 100 lb.
83	Salt—in bulk.....	7c. per 100 lb.
83	Sodium sulphate—crystallized or Glauber's salt.....	\$1.00 per ton
1667	Sodium sulphate, crude or salt cake.....	Free
207	Silica—crude, not specially provided for.....	\$4 per ton
207	Silica—for use as pigment, not specially provided for.....	\$7.50 per ton
209	Talc—crude.....	½c. per lb.
209	Talc—ground, washed, powdered, or pulverized (except toilet preparations).....	25% ad val.
1675	Tripoli—crude or manufactured, not specially provided for.....	Free
(c) On Structural Materials and Clay Products		
Clay Products—		
201	Brick—bath, chrome and fire, n.s.p.f.....	25% ad val.
	Magnesite brick.....	½c. per lb. and 10% ad val.
1536	Brick—not specially provided for.....	*Free
207	China clay or Kaolin.....	\$2.50 per ton
207	Clays or earths, unwrought or unmanufactured, including common blue clay and Gross-Almerode glass pot clay, n.s.p.f.....	\$1.00 per ton
207	Clays or earths, wrought or manufactured, n.s.p.f.....	\$2.00 per ton
210	Earthenware—common yellow, brown or gray made of natural, unwashed, and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing not ornamented, incised, or decorated in any manner.....	15% ad val.
210	Earthenware—common yellow, brown, or gray earthenware made of natural, unwashed and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing ornamented, incised, or decorated in any manner and manufactures wholly or in chief value of such ware, n.s.p.f.....	20% ad val.
210	Earthenware—Rockingham.....	25% ad val.
203	Lime—n.s.p.f., including weight of container.....	10c. per 100 lb.
203	Lime—hydrated, including weight of container.....	12c. per 100 lb.
237	Slates—slate chimney pieces, mantles, slabs for tables, roofing slates, and all other manufactures of slate, n.s.p.f.....	15% ad val.
Stone—		
203	Limestone—(not suitable for use as monumental or building stone) crude, or crushed but not pulverized.....	5c. per 100 lb.
235	Limestone, freestone, granite, sandstone, lava and all other stone suitable for use as monumental or building stone, except marble, breccia, and onyx, n.s.p.f., hewn, dressed, or polished, or otherwise manufactured.....	50% ad val.
235	Unmanufactured, or not dressed, hewn or polished.....	15c. per cubic ft.
232	Marble, breccia and onyx, in block, rough or squared only.....	65c. per cubic ft.
232	Marble, breccia and onyx, sawed or dressed, over two inches in thickness.....	\$1.00 per cubic ft.
232	Marble, breccia and onyx slabs and paving tiles, containing not less than four superficial inches, if not more than one inch in thickness.....	8c. per superficial foot
	If more than one inch and not more than one and one-half inches in thickness.....	10c. per superficial foot
	If more than one and one-half inches and not more than two inches in thickness.....	13c. per superficial foot
	If rubbed in whole or in part.....	3c. per superficial foot in addition.
	Mosaic cubes of marble, breccia, or onyx, not exceeding two cubic inches in size, if loose.....	One-fourth of one cent per lb. and 20% ad val.
	If attached to paper or other material.....	5c. per superficial foot and 35% ad val.
1675	Stone and sand: burrstone in blocks, rough or unmanufactured; quartzite; traprock; rottenstones; tripoli and sand, crude or manufactured; cliffstone; freestone; granite and sandstones; unmanufactured, and not suitable for use as monumental or building stone; all of the foregoing n.s.p.f.....	Free

*Except on imports from countries which impose a duty on similar products imported from U.S. On imports of these commodities a corresponding duty is levied.

†In effect Dec. 10 1927. Previous rates ¾c. and ½c. T. D. 42429.

Table 43.—Accidents in the Mining Industry in Canada, by Provinces*, 1929

Cause of Accident	Nova Scotia		New Brunswick		Quebec		Ontario		Saskatchewan		Alberta		British Columbia		Canada	
	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal
UNDERGROUND—																
Falls of roof or face.....	10	849	1	52	3	69	6	304	5	14	46	11	372	45	1,697	
Mine cars and locomotives.....	6	589	38	27	6	134	8	48	7	209	21	1,053				
Gas and dust explosions.....	5	6	8	2	6	11	17	4	3	8	18	63				
Explosives.....	3	8	2	6	11	17	2	21	3	8	18	63				
Electricity.....	1	2	1	1	23	1098	24	1	1	4	3	6				
Miscellaneous.....	4	790	1	84	4	216	23	1098	24	3	29	4	756	39	2,997	
Total.....	21	2238	2	188	10	318	40	1553	37	28	148	25	1357	126	5,839	
SURFACE—																
Haulage and cars.....	101	6	4	19	2	45	1	1	1	50	8	222				
Machinery.....	1	56	1	1	50	3	68	6	84	5	265					
Miscellaneous.....	2	331	15	89	10	723	2	12	483	14	1,653					
Total.....	3	488	22	5	158	15	836	3	19	1	617	27	2,140			
Grand Total.....	24	2726	2	210	15	476	55	2389	37	31	167	26	1974	153	7,979	

*Data for Manitoba not available.

CHAPTER TWO

THE GOLD MINING INDUSTRY IN CANADA

(With tables showing the production of gold)

1. General Review.
2. Review of the Gold Mining Industry in Canada by Areas.
3. The Alluvial Gold Mining Industry.
4. The Auriferous Quartz Mining Industry.
5. The Copper-Gold-Silver Mining Industry.
6. Commodity Statistics—including tables showing production by provinces, imports, exports, and world output of gold.

1. General Review

CANADA

(a) *Definition of the Industry.*—Canada's gold mining industry is classified into three main divisions: the direct recovery of placer gold or the alluvial gold mining industry; the extraction of the metal from gold-bearing quartz ores, designated as the auriferous quartz mining industry; and the supply coming, as a by-product, through the metallurgical treatment of base metal ores and, in this classification, called the copper-gold-silver mining industry. Gold obtained in the copper-nickel, silver-lead, and other mining industries is included in the total production of the country.

(b) *Historical.*—The early history (1850-1895) of gold production in Canada is largely confined to the placer operations of the pioneer prospector in British Columbia, and it was from this source that most of the metal was derived until the discovery, in 1896, of the extremely rich gravels of the Klondike river in the Yukon Territory; between 1898 and 1905 gold to the value of more than \$100,000,000 (4,838,000 fine ounces) is stated to have been obtained from the placers of the Bonanza, Eldorado, Hunker, Dominion and Sulphur Creeks. Coincident with this western activity was witnessed the Lake of the Woods (Ontario) discoveries and renewed activity on the Nova Scotia quartz veins. The past fifteen to twenty years, although seeing the decline of the alluvial industry, have given to the nation the highly productive auriferous quartz mines of the Porcupine and Kirkland lake camps. The base metal mining industries contribute a considerable amount of gold to Canada's total production. This is most highly reflected by the recent expansion in the copper-gold industry and is strikingly exemplified by the Noranda development in the province of Quebec.

(c) *Sources.*—In 1929 the auriferous quartz mines contributed 87 per cent of the total Dominion production; alluvial deposits, 2 per cent; Canadian smelters, in base bullion and blister copper, 5 per cent; and gold recovered by foreign plants in the treatment of Canadian ores, 6 per cent.

(d) *Importance of the Industry.*—Gold in 1929 held third place in the valuation of Canada's mineral output and amounts to 12.8 per cent of the total value. A continuous growth in the industry during recent years has established for the country a prominent position among the world's gold producers; the conglomerate reefs of South Africa with their consistent values and great tonnage still account for more than half of the annual total, the United States with a slowly diminishing production retains second place, while Canada follows closely in third position with a new high record production in 1929 of 1,928,308 fine ounces valued at \$39,861,663. The discovery and development of our more important gold deposits have not only made large direct contributions to the wealth of the nation but have assisted materially in the colonization of our northern agricultural lands, the harnessing of important water powers, and the general development of our northern natural resources.

2. Review of the Gold Mining Industry by Areas

NOVA SCOTIA

Gold mining in Nova Scotia dates back to the early sixties. Annual yields varying from 6,863 fine ounces to 30,348 fine ounces are recorded from 1862 to 1902, in 1904 production dropped to 10,362 ounces and remained around this figure until 1910. Since then there has been no appreciable increase in production. The total value of the provincial gold output amounts to \$19,078,862 of which \$55,545 was contributed during 1929.

There has been considerable discussion regarding the economic geology of the Nova Scotia deposits. Gold, usually in the free state, and often as rich concentrations of native metal, occurs in comparatively narrow quartz leads or multiple vein systems called belts. Values are often associated with arsenopyrite and in one district with antimony; at present there are about one hundred known localities where gold has been found in situ. The veins occur, in most instances, in anticlinal folds of slate or quartzite. These auriferous areas have witnessed some renewed activities during the past few years. Hydro electric power is now available throughout the greater part of the province.

QUEBEC

Quebec, although not a gold producer of great prominence, is known to possess several large gold bearing districts of considerable merit, some of which have been hampered in exploration or development by lack of transportation facilities. The Chibougamau area was quite active during the year; the recently discovered copper-gold deposit near Opemiska Lake appears to possess distinct economic possibilities and in the Rouyn and northwestern districts the Noranda operations were outstanding. This company's gold production from sulphide ores is now an important item in the country's precious metal output. During 1929 the smelter treated 428,221 tons of ore from which were made 51,625,478 pounds of blister copper containing 2.66 ounces of gold per ton. The Siscoe mill was completed early in the season and production was continuous throughout the year. Development of ore reserves was extensive at the Grenada Rouyn gold mine and the O'Brien Cadillac made several shipments of high grade ore. Production of gold from this province in 1929 totalled 90,798 fine ounces valued at \$1,876,961.

ONTARIO

The production of gold in Ontario has shown a remarkable growth during the past twenty years. The rise and fall in the production figures of individual camps reflects, in many instances, the vicissitudes encountered in the underground exploration and development of complex ore shoots or intricate vein structures.

Ontario mines, during 1929, recovered 1,622,267 ounces of fine gold amounting to 84.1 per cent of the total Canadian gold production. This remarkable growth of the industry in Ontario may be appreciated in a comparison with the 1913 record of 219,801 ounces, which, in that year, formed 27.4 per cent of the national total.

The Porcupine area, with nine major operating mines, produced 932,732 ounces of fine gold in 1929 with a value of \$19,281,281. The Hollinger, ranking as one of the world's largest gold mines, retained the first position as a Canadian gold producer. The McIntyre, benefiting from an intensive program of modern mine development, attained second place of importance in the list of camp producers. Production at the Dome mine was affected by the loss of its mill by fire during the month of October; the annual gold recovery, however, was sufficiently great to command a third position of importance. Other Porcupine producing mines in the order of the value of their output were the Vipond, Coniaurum, March, West Dome Lake, Ankerite, and Porcupine United. The aggregate yield of gold from the Porcupine area has now reached a value of \$247,392,356.

The quartz veins or masses of the Porcupine camp are associated with quartz porphyries, schistose volcanics of Keewatin age and Temiskaming sediments. The ore bodies vary in shape the most characteristic type is the quartz lens of irregular form, the most conspicuous of which have been found at the Dome.

In the Kirkland lake district the more recently developed mines have, since their discovery in 1911, recovered 2,016,396 ounces of fine gold. This production came principally from the Lake Shore, Teck-Hughes and Wright Hargreaves mines. Other important producers are the Kirkland lake, Sylvanite and Barry-Hollinger, the last located a few miles to the south in the Boston Creek section. Most of the properties during 1929 pursued energetic development and exploration operations. Serious endeavours were continued, especially to the East, to enlarge the camp's productive area. Modern mining and milling practices reached a new high standard of perfection.

Values in the Kirkland Lake camp are believed to be genetically related to a feldspar porphyry intrusive. The gold deposition appears to follow a main fault zone through a series of Temiskaming sediments, feldspar porphyries and Keewatin rocks. The main fissure and shatter zone vein fillings are principally composed of quartz; gold values are often high across several feet of vein matter; free gold and tellurides are quite common.

The results of the widespread prospecting and exploration activity of 1928 appeared to lead to a concentration of effort in 1929. Doubtful prospects were eliminated and efforts directed to more promising properties. In the Patricia district the Howey mine continued with the development of their ore reserves and the construction of a modern mill was commenced. Prospects in the Woman and Pickle lake areas were quite active and considerable valuable information regarding their economic geology was obtained. Several of the older mining districts were investigated and in some instances unprofitable mines of the straight amalgamation period were re-examined with the supposition that modern mining and milling methods might permit of their economical operation.

The metallurgical plants of the International Nickel Company produce a considerable amount of gold in the treatment of the copper-nickel ores mined in the Sudbury district. Precious metal recoveries are made in refineries operated at Clydach, Wales, and Port Colborne, Ontario. In addition to the gold coming from the nickel bearing sulphides there is an appreciable quantity contained in the concentrates made from the complex copper-lead-zinc ores mined in the western inner section of the Sudbury basin.

Ore deposits occurring in rocks of pre-Cambrian age provide all of Ontario's gold production. There is, in the productive camps, a strong similarity in the close relationship of the deposits with acid intrusives of Algonian age. Deposition from gold-bearing solutions is believed to have focused in sheared or schisted zones subsequent to intense igneous activity which was accompanied by the faulting or fracturing of the Keewatin and Temiskaming rocks.

PRAIRIE PROVINCES

MANITOBA, SASKATCHEWAN and ALBERTA.—The greater portion of the southern sections of these three provinces is underlain by a series of post Cambrian sediments, a series of rocks unlikely to contain gold bearing deposits.

The northern parts of Manitoba and Saskatchewan possess large areas of pre-Cambrian rocks. In Alberta the exposure of these older formations is much less, consisting of about 5,000 square miles. It is in comparatively recent years that anything approaching a widespread exploration of these virgin areas has been attempted. Transportation facilities have been quite limited and movement of supplies confined to the main waterways. The topography and geology resembles in general features those of the eastern archæan peneplain with possibly a higher percentage of muskeg or bog land. Aerial transportation has, in the last few years, made rapid strides in the northern sections of the Prairie Provinces. Prospectors with supplies are now able to reach the most remote locations with comparative ease.

Gold has been found over widely scattered areas in Manitoba and at locations in Saskatchewan. In the eastern or Rice-Long lakes section of Manitoba several promising gold properties have been systematically explored with encouraging results. The Central Manitoba mine is now in its third year of production and development of the San Antonio near Rice Lake is yielding very favourable results. In the northwest section of Manitoba several areas were quite active during 1929. Copper-gold deposits at Oxford lake were diamond drilled and exploratory work done on several gold-bearing claims in the Herb and Elbow Lakes districts.

The most important mining operations in the province were centered towards the Saskatchewan boundary at the Flin Flon and Sherritt Gordon mines. Both companies were very

active in exploration and in the development of ore reserves. The Hudson Bay Mining and Smelting Company carried on construction of modern metallurgical plants for the treatment of Flin Flon and custom ores. The sulphide ore deposits of the Flin Flon and Sherritt Gordon mines, although differing in some respects as to their geology and mineralization will yield essentially copper-gold-zinc ores. It is expected that both blister copper and refined zinc will be produced at the former property sometime during the coming year.

There is no record of any important gold production from Alberta. Efforts to profitably recover small amounts of gold contained in the sands and gravels of the Saskatchewan river were attempted several years ago.

BRITISH COLUMBIA

The gold production in British Columbia from 1858 to 1892 came entirely from placer operations, the greater part of this being from the Cassiar and Cariboo districts. In 1929 the value of alluvial production amounted to \$111,298, a decrease of \$31,710 from the previous year, 87 per cent of this recovery coming from the Cariboo, Quesnel and Atlin mining divisions. Hydraulic plants were erected during the year in a number of placer fields, some of which may be productive during 1930.

A decrease in lode gold production during 1929 is attributed to cessation of mining at Rossland and a lowering in grade of the Premier ores. The Portland Canal division contributed 96,676 ounces or approximately 66 per cent of the provincial total. A large proportion of the annual production comes from the treatment of complex ores in which silver, copper, lead and zinc are often important constituents. Smelters recovered 107,248 ounces of gold from this type of ore during 1929 while 17,609 fine ounces were extracted at the quartz-gold mines by cyanidation or other local treatments.

The economic geology of British Columbia gold deposits is, on the whole, considerably different to that found in the eastern camps. Intrusives and sediments of much later geological ages are often encountered and the rugged topography is in strong contrast to the weathered and glaciated pre-Cambrian surfaces of Manitoba, Ontario and Quebec.

YUKON

An alluvial gold production of 35,678 fine ounces in the Yukon during 1929 showed a slight increase over the 34,313 ounces recorded in 1928. Yukon gold production now occupies a fourth position in the list of gold recoveries reported by the different gold mining provinces and territories of the Dominion. During 1929 there was only one company operating dredges, some hydraulic operations were reported and 56 miles of ditches were in operation or under construction. It is estimated that the material handled in placer mining amounted to 4,500,000 cubic yards. Numerous individual operators and prospectors were active throughout the Territory.

The total gold production and general magnitude of gravel washing in 1929 is in sad contrast to those of the old bonanza years when during the year 1900, 1,077,553 fine ounces were recovered. The production mounted rapidly for a few years following the sensationally rich discoveries of '96 and '97; then followed a history of lessened individual recovery, depleted values and the entry of the large operators. Modern dredges and systematic hydraulic mining largely accounted for an increased production from 1909 to 1913. The last two decades have portrayed a picture of clean-up extractions and declining recoveries.

(3) The Alluvial Gold Mining Industry

It is very difficult to secure complete information on alluvial mining in Canada since placer fields are mostly remote and except in a few cases are operated by small numbers of men of no fixed abode. Dredging and hydraulic mining companies operating in the Yukon Territory send annual returns to the Bureau and with the aid of the *Mining Lands Branch*, Department of Interior, under whose regulations mining is carried on in this territory, more definite information is obtainable. The report of the Gold Commissioner, Dawson, Yukon Territory, regarding mining for the year ending March 31, 1930, is as follows:—

REPORT OF THE GOLD COMMISSIONER, DAWSON, YUKON TERRITORY, REGARDING MINING

Placer Gold Mining.—The amount of placer gold mined during the year on which royalty export tax was paid was 44,197.92 ounces, an increase over the previous year of 559.09 ounces.

Yukon Consolidated Gold Corporation, Limited.—This company operated dredge Canadian No. 2 on Hydraulic Mining Lease No. 18. The dredge commenced digging on May 24, and closed down on October 1, having dredged 1,300,000 cubic yards, all of which was artificially thawed by water pumped from the Klondike River and distributed through the system by pipe lines. Three Keystone drills drilled the pits in which the pipes were inserted in order to force the water to bed rock. Water was delivered under a pressure of forty-five pounds at the points.

Dredge Canadian No. 3.—This dredge, which had been idle since 1918, was reconditioned and commenced digging on September 25. It closed down on December 1, having dredged a total of 450,000 cubic yards. It also operated on Lease No. 18.

Dredge Canadian No. 4.—This dredge commenced digging on June 6, on Lease No. 18, and closed down on November 1, having handled 1,100,000 cubic yards during the season.

Dredge New North West N. 1.—Commenced operations on Upper Dominion Creek on June 22, and closed down on November 1, a total of 600,000 cubic yards was dredged. All of the ground was artificially thawed, a thawing plant of 1,600 points being operated. The water for thawing was pumped from Dominion Creek by two electrically driven pumps and delivered at the points under a pressure of thirty pounds.

Dredge New North West No. 2.—Also operated on Dominion Creek just below the Town of Granville. It commenced operations on May 28, and closed down on November 21, having dredged 460,000 cubic yards. A thawing plant of 1,000 points thawed ground ahead of the dredge. The water flowed by gravity through ditches constructed under Water Grants Nos. 9024 and 9025.

Hydro-Electric Power Plant.—This plant, which is operated by water taken from the North Fork of the Klondike River under Water Grant No. 10, operated continuously throughout the year. Power was furnished for all the dredges which operated throughout the season. Two Marion electrically driven shovels were operated digging an extension of the power canal 15.6 miles in length, which, when completed, will carry 20,000 inches of water from the South Fork of the Klondike and discharge it into the North Fork above the intake of the present ditch.

Power was also furnished to the Dawson Electric Light and Power Company for lighting the City of Dawson, and to the Dawson City Water and Power Company, for pumping and heating the water circulated through the city mains. A total of 11,565,000 k.w.h. was generated and transmitted to the various operations during the year.

Transmission lines.—One hundred and thirty miles of high tension power lines, which connected the power plant with the various sub-stations, were maintained in an efficient state of repair.

Hydraulics.—Two nozzles were operated at Crofton Gulch and two on Lovett Gulch. Water for these operations was supplied through the Twelvemile Ditch. A total of 530,000 cubic yards of gravel and bed rock was sluiced during the season.

Repairs to the ditch commenced on May 1, and were suspended on November 1. Hydraulic licensing commenced on May 15, and closed on September 30.

Transportation.—Four caterpillar tractors, four trucks and nine cars were in constant use during the season. Two new trucks purchased in 1929.

An average of two hundred and twenty-five men was employed during the season.

Other Placer Operations.—Many individuals and miners working in partnership were engaged in placer mining and experienced a successful season. The prospecting leases on Thistle Creek have been renewed. Considerable work was done on them last summer with a drag line scraper, and it is the intention to prosecute the work vigorously this summer. Prospecting leases have also been issued as follows:—Five miles on Selwyn River; one mile on Nansen Creek; one mile on Johnson Creek, a tributary of the McQuesten River; one mile on Upper Bonanza; one mile on Victoria Gulch, a tributary of Upper Bonanza; two miles on Gauvin Gulch, and one mile on O'Neil Gulch, which are also tributaries of Upper Bonanza, and one mile on All Gold Creek. It is hoped that some good results may follow from these operations.

The dredge which was lying idle in the Glacier District for many years was taken over by a new company, and they commenced operations last summer on Sixtymile Creek. They employed from twelve to fifteen men during the season and dredged about 100,000 cubic yards. The manager of the company operating this dredge left Dawson about a month ago to make preparations for this season's work, and they are apparently well satisfied with the results obtained.

Lode Mining, Dawson District.—Development work has been continued on the "Lone Star" group of claims on Victoria Gulch. Last summer they drove a tunnel in unbroken ground 82 feet south of the old tunnel for a distance of 205 feet.

The extension of the "Carthey" vein was crosscut 146 feet from the entrance. The vein at the point of intersection was about four and one-half feet wide. An average of six men was employed during the season. It is the intention of the company to prosecute operations during this summer.

Claims on the Fifteenmile on the Yukon River, on Little Twelvemile, on Eldorado Creek and on Gold Run are still being held, but no extensive work has been done. The conglomerate claims on Indian River are in the same position as last year, several claims being held with the hope of obtaining capital for development.

Mayo District.—The principal operator in this district is the Treadwell Yukon Company, Limited. At the end of the year this company had under option, purchase, or located in its own name, sixty-three claims, or a total area of 1,677 acres, divided into seven separate groups for mining and prospecting purposes. During the year the company acquired the "Silver King" group of nine claims with an area of 274 acres. This property is located on Galena Hill.

During the summer months the company shipped 6,909.49 tons of ore and concentrates containing 3,102,093 ounces of silver and 7,810,493 pounds of lead, which had a metal value of \$1,586,756.06 for the silver, \$528,360.10 for the lead, and \$3,397.66 for the gold ore, a total value of \$2,118,513.82. In addition, the company was instrumental in shipping for individual operators a total of 690 dry tons containing 185,503.92 ounces of silver and 952,092 pounds of lead, the smelter value of which was \$95,295.13 for the silver and \$62,888.03 for the lead, a total of \$158,183.16. The total production of the camp was 7,599 dry tons valued at \$2,276,696.98, besides 135.24 dry tons of ore containing 216 ounces silver per ton, and 64% lead, were shipped to the Selby Smelter for Anderson and Pickering. It is assumed that between 10,000 and 11,000 tons of ore will be shipped this year.

New Construction.—At the main camp of the Treadwell Yukon Company, Limited, a new 180 H.P. Diesel Engine was installed to drive the compressor. At the "Mastiff" group a 1,500-foot transmission line was built to supply electrical energy for that operation.

At the "Elsa" group a new bunk house, a mess house with a capacity for taking care of thirty men, were erected, as well as blacksmith shop, compressor and change room. A 110 H.P. Diesel Engine was installed to drive a new 500 cubic foot air compressor.

At the "Silver King" group a new bunk house, two head frames, two ore bins, a large compressor, a hoist house and a blacksmith shop were built. This mine is equipped with a 165 H.P. Diesel Engine driving a 600 cubic foot compressor and a 75 K.W. generator.

Sixteen miles of road were also constructed from the Mayo-Keno Road junction at Williams Creek, to facilitate handling supplies to the "Mastiff", "Elsa" and "Silver King" groups.

In the Town of Mayo the company installed a 110 H.P. Diesel Engine to drive a 60 K.W. generator for lighting the town and furnishing power.

Outside of the operations of this company, considerable prospecting and development work has been done by individuals with promising results.

In the Beaver River District prospecting was carried on by the Consolidated Mining and Smelting Company on properties which they had under option. They employed eight men during the months of July and August, carrying out preliminary prospecting with a diamond drill. Several holes were drilled, some to a depth of 700 feet, but they have since released their options and have moved the machinery about thirty-five miles further north on Silver Hill to the Carpenter and McLean group of claims, where drilling operations will be carried on during the coming summer.

The outlook for the future of this camp is promising, notwithstanding the drop in the price of silver and the consequent curtailment of mining operations by the Treadwell Yukon Company, Limited. There will be more activity by individual prospectors and claim owners on the different hills. The closing down of low grade silver and lead mines on the outside should eventually turn the attention of capital to the high grade deposits contained in this territory, for even at the present low price of silver and the high cost of transportation to the smelters, the ore being shipped out this season will net a handsome profit to the shippers.

Table 44.—Principal Statistics of the Alluvial Gold Mining Industry in Canada, 1928 and 1929

Item	British Columbia		Yukon		Canada	
	1928	1929	1928	1929	1928	1929
Number of firms and individual operators*..	43	54	39	14	82	68
Time in operation—months.....	6-8	6-8	6-8	6-8	6-8	6-8
Capital employed..... \$	1,804,645	3,201,699	8,579,930	4,036,151	10,384,575	7,237,850
Number of employees.....	200	244	142	244	342	488
Wages paid..... \$	168,212	214,040	370,058	372,153	538,270	586,193
Fuel and electricity used..... \$	7,534	2,969	49,644	.....	57,178	2,969
Electricity generated—						
(a) for own use..... k.w.h.	.....	.....	3,080,890	9,040,492	3,080,890	9,040,492
(b) for sale..... k.w.h.	.....	.....	6,744,140	2,365,008	6,744,140	2,365,008
Value of electricity sold..... \$	.....	.....	67,741	23,650	67,741	23,650
Crude gold recovered..... crude oz.	8,424	6,447	42,645	44,598	51,069	51,045
Value of gold and silver..... \$	140,189	109,599	709,727	724,708	849,916	834,307
Platinum recovered..... crude oz.	49	28	.....	.....	49	28
Value of platinum recovered..... \$	2,819	1,699	.....	.....	2,819	1,699
Quantity of material handled..... cubic yd.	1,188,667	1,336,390	5,097,182	4,500,000	6,285,849	5,836,390
Length of ditches..... miles	81	93	90	56	171	149
Total value of alluvial gold production..... \$	143,008	111,298	709,727	724,708	852,735	836,006

*In addition to the number shown in the table there were many individual operators from whom no returns were available.

4. The Auriferous Quartz Mining Industry

This industry includes the mining and milling of ores in which gold is the predominating metal and from which the values are usually recovered by various systems of cyanidation or amalgamation. Refractory ores containing lead, copper, arsenic, antimony and sometimes other metals are usually concentrated by selective flotation or other methods and the gold-bearing concentrates shipped to smelters for further treatment. Gold occurs in Nova Scotia in both free milling ores and in association with arsenic and antimony. In northwestern Quebec two mines operate on free milling quartz ores, one amalgamating and cyaniding, the other cobbing and shipping high grade ore. The majority of the larger gold mines in Ontario have adopted straight cyanidation, some of the smaller producers recover only by amalgamation and in a few instances a combination of the two methods is utilized. There is, in the ores from the large Ontario mines, an average proportion of 7 ounces of gold to 1 of silver. A greater variety of gold ore is mined in British Columbia than in any of the other provinces. This is emphasized in the different metallurgical processes involved in the provincial gold recoveries. As a general rule, each ore with its own type of mineralization, requires its own peculiar extraction methods. The rich gold-silver-lead ores of the Premier mine, are concentrated and the concentrates shipped to other plants for smelting.

Table 45.—Capital Employed by Provinces in the Auriferous Quartz Mining Industry in Canada, 1928 and 1929

—	*Nova Scotia		Ontario		British Columbia		Canada	
	No.	\$	No.	\$	No.	\$	No.	\$
1928								
Producing.....	5	4,921,235	20	82,359,828	9	12,132,661	34	99,413,724
Operating but not producing.....	10	4,308,057	48	40,732,215	8	3,239,714	66	48,279,986
Total.....	15	9,229,292	68	123,092,043	17	15,372,375	100	147,693,710
1929								
Producing.....	6	7,932,009	21	85,547,367	11	14,440,638	38	107,920,014
Operating but not producing.....	10	6,588,356	31	19,303,330	6	1,354,405	47	27,246,991
Total.....	16	14,520,365	52	104,850,697	17	15,795,043	85	135,166,105

*Includes data for 1 producing mine and 1 non-producing in Manitoba in 1928, also for 1 producing and 4 non-producing in Quebec in 1928, and for 1 producing and 2 non-producing in Manitoba in 1929, also for 2 producing and 4 non-producing in Quebec in 1929.

Table 46.—Ores Mined and Milled, Crude Bullion Produced and Shipped from the Auriferous Quartz Mines in Canada, by Provinces, 1928 and 1929

	*Nova Scotia	Ontario	British Columbia	Canada
1928				
Number of producing mines.....	5	20	9	34
Ore mined..... tons	55,079	4,212,789	333,760	4,601,628
Ore milled..... tons	55,124	4,218,680	209,249	4,483,053
Tailings re-treated..... tons			43,536	43,536
Bullion recovered by amalgamation..... crude oz.	1,586	143,509		145,095
Bullion recovered by cyanidation..... crude oz.	53,734	1,825,525	26,601	1,905,860
Bullion shipped..... crude oz.	55,830	1,967,217	26,601	2,049,648
Content of bullion shipped—Gold..... fine oz.	21,566	1,569,614	16,157	1,607,337
Silver..... fine oz.	1,881	241,824	1,536	245,241
Value..... \$	443,463	32,586,436	334,643	33,364,542
Exchange premium..... \$		2,811		2,811
Net value of ores, slags and residues sold..... \$		44,139	3,243,838	3,287,977
Total net receipts..... \$	443,463	32,633,386	3,578,481	36,655,330
1929				
Number of producing mines.....	6	21	11	38
Ore mined..... tons	88,057	3,952,027	314,660	4,354,744
Ore milled..... tons	91,404	3,952,535	209,055	4,252,994
Tailings re-treated..... tons		7,290	41,417	48,707
Bullion recovered by amalgamation..... crude oz.	17,633	144,294	295	162,222
Bullion recovered by cyanidation..... crude oz.	66,606	1,802,155	24,999	1,893,760
Bullion shipped..... crude oz.	85,283	1,977,103	25,294	2,087,680
Contents of bullion shipped—Gold..... fine oz.	42,779	1,609,544	17,609	1,669,932
Silver..... fine oz.	3,921	256,256	1,363	261,540
Value..... \$	862,660	33,406,105	325,342	34,594,107
Exchange premium..... \$		157,464	3	158,234
Net value of ores, slags and residues sold..... \$	8,796	14,076	2,500,773	2,523,645
Total net receipts..... \$	872,223	33,577,645	2,826,118	37,275,986

*Includes data for 1 mine in Manitoba, and for 1 in Quebec in 1928, also for 1 in Manitoba and 2 in Quebec in 1929.

Table 47.—Ores, Concentrates and Slags Shipped from the Auriferous Quartz Mines in Canada, 1928 and 1929

Item	*Ontario mines shipping		†British Columbia mines shipping		Canada
	To Canadian smelters	To Foreign smelters	To Canadian smelters	To Foreign smelters	
1928					
Number of mines.....	2	3	7	2	14
Tons of ore, etc. shipped.....	2	197	21,003	111,748	132,950
Metal content—					
Gold..... oz.	16	1,582	13,748	119,637	134,983
Silver..... oz.	630	5,771	313,916	2,182,405	2,502,722
Copper..... lb.	586	71,839	28	323	72,776
Lead..... lb.			635	46	681
Zinc..... lb.					
Arsenic..... lb.				1,318,000	1,318,000
Net value..... \$	630	43,509	337,929	2,905,909	3,287,977
1929					
Number of mines.....	2	3	6	4	13
Tons of ore, etc., shipped.....	269	44	27,278	93,203	120,794
Metal content—					
Gold..... oz.	329	714	14,327	86,224	101,594
Silver..... oz.	766	218	389,450	2,035,899	2,426,333
Copper..... lb.	9,605	206			9,811
Lead..... lb.			2,945	160,000	162,945
Zinc..... lb.					
Arsenic..... lb.				1,487,175	1,487,175
Net value..... \$	8,198	14,674	341,265	2,159,508	2,523,645

*Includes data for 1 mine in Quebec, 1929.

†2 Mines in British Columbia shipped to both Canadian and Foreign smelters.

Table 48.—Employees, Salaries and Wages in the Auriferous Quartz Mining Industry in Canada by Provinces, 1928 and 1929

Province	1928						1929					
	Number of employees					Salaries and wages	Number of employees					Salaries and wages
	On salary	Wage-earners			Total employees		On salary	Wage-earners			Total employees	
		Surface	Under-ground	Mill				Surface	Under-ground	Mill		
						\$						\$
Nova Scotia.....	9	42	41	4	96	75,172	11	23	27	5	66	48,321
Quebec.....	32	154	7		193	342,922	37	101	75	7	220	340,185
Ontario.....	492	2,098	4,714	630	7,934	12,714,888	386	1,805	4,708	570	7,469	12,333,389
Manitoba.....	10	48	87	9	154	307,456	14	49	98	13	174	376,721
British Columbia.....	65	255	304	65	689	1,175,552	76	240	315	100	731	1,160,117
Canada.....	608	2,597	5,153	708	9,066	14,615,990	524	2,218	5,223	695	8,660	14,258,733

Table 49.—Wage-Earners in the Auriferous Quartz Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	2,289	4,717	685	7,691	2,086	5,001	606	7,693
February.....	2,384	4,777	679	7,840	2,102	5,026	616	7,744
March.....	2,475	4,855	690	8,020	2,087	5,053	636	7,776
April.....	2,447	4,845	709	8,001	2,067	5,097	655	7,819
May.....	2,579	4,906	697	8,182	2,079	5,193	663	7,935
June.....	2,547	5,034	705	8,286	2,157	5,046	656	7,859
July.....	2,437	5,102	684	8,223	2,196	5,062	672	7,930
August.....	2,436	5,052	665	8,153	2,127	5,180	680	7,987
September.....	2,458	5,072	669	8,199	2,118	5,165	681	7,964
October.....	2,493	5,209	672	8,374	2,176	5,228	698	8,102
November.....	2,361	5,156	666	8,183	1,996	5,081	682	7,759
December.....	2,144	4,882	617	7,643	1,883	4,845	610	7,338

5. The Copper-Gold-Silver Mining Industry

Many of the ores in which copper values predominate are often mineral combinations or intergrowths of the metal bearing sulphides, pyrite, pyrrhotite and chalcopyrite with zinc blende a common additional component. These sulphide ores often contain important gold, silver and other precious metal values which are recovered as by-products in the production of refined copper from ores mined in the copper-gold-silver mining industry.

The mining and smelting of these ores has been a very important industry in British Columbia for many years. Early in 1929 the Bonanza mine in the Anyox section was brought into production by the Granby Company. This company also operated steadily at their smelter and Hidden Creek mine and in addition shipped Copper Mountain concentrates to Trail and Tacoma. The Britannia Company at Howe Sound reached a new high record production in mine tonnage and copper and silver produced. In the Quatsino Sound section the Coast Copper Company carried on a large development and construction programme. The Flin Flon and Sherritt Gordon properties in Manitoba were intensely active in the development of their sulphide ore deposits and preparations were commenced for the construction of metallurgical plants. Smaller operators in Ontario made a few shipments of copper ore from mines still in the prospect stage. The Waite-Montgomery and Horne mines both increased their shipments of copper-gold ores to the Noranda smelter. These increased tonnages accounted for a new high provincial output in copper and gold. This production together with the metal contained in the concentrates shipped by the Consolidated Copper and Sulphur Company from the Eustis mine constitute Quebec's important contribution to the Canadian copper and gold productions.

Because of interplant relations, companies which mine and smelt their own ore sometimes have difficulty in making a separation of the capital employed at the mine and smelter. The value placed on their own ore at the mine may be nominal and any profit accruing from the operations would appear to be credited to the smelter. For that reason the net value placed on shipments to the smelter may not be the same as the value computed from the metal content as determined by settlement assay.

Table 50.—Capital Employed by Provinces in the Copper-Gold-Silver Mining Industry in Canada, 1928 and 1929

	Quebec		Ontario		Manitoba		British Columbia		Canada	
	No.	\$	No.	\$	No.	\$	No.	\$	No.	\$
1928										
Producing.....	3		1				15		19	27,096,837
Operating but not producing.....	126		4		7		18		155	22,907,503
Total.....	129	18,705,947	5	4,837,587	7	2,323,507	33	21,137,299	174	50,004,340
1929										
Producing.....	6		7				13		26	20,552,263
Operating but not producing.....	95		3		3		25		126	31,994,434
Total.....	101	14,288,825	10	7,649,632	3	6,083,677	38	24,524,563	152	52,546,697

Table 51.—Ore Mined and Milled in the Copper-Gold-Silver Mining Industry, in Canada, 1928 and 1929

	Quebec	British Columbia	Canada
	Tons	Tons	Tons
1928			
Ore mined.....	* 290,134	3,972,688	4,262,822
Ore milled.....	50,494	3,722,662	3,773,156
Copper concentrates produced.....	2,085	223,801	225,886
Pyrite concentrates produced.....	1,496	63,983	65,479
1929			
Ore mined.....	* 520,652	4,614,172	5,134,824
Ore milled.....	102,194	4,410,612	4,512,806
Copper concentrates produced.....	20,546	242,395	262,941
Pyrite concentrates produced.....	20,186	56,395	76,581

* Contains small tonnage of ore mined in Ontario.

Table 52.—Shipments from Copper-Gold-Silver Mines of Canada, 1928 and 1929

Destination	Quantity	Net value	Content as determined by settlement assay			
			Gold	Silver	Copper	Sulphur
	Tons	\$	Fine oz.	Fine oz.	Pounds	Tons
1928						
12 mines shipped to Canadian smelters—						
†Ores.....	480,768	4,341,241	61,412	272,195	44,211,488	
Copper concentrates.....	104,181	4,397,183	5,717	271,123	40,784,503	
8 mines shipped to Foreign smelters—						
*Ores.....	3,127	47,564	248	1,243	294,654	834
Copper concentrates.....	125,457	6,235,077	17,434	264,981	51,640,970	
Pyrite concentrates.....	65,479	260,454				32,782
Total.....	779,012	15,281,519	84,811	809,542	136,931,615	33,616
1929						
18 mines shipped to Canadian smelters—						
Ores.....	570,791	6,709,550	67,008	432,951	57,063,264	
Copper concentrates.....	117,744	4,275,044	9,914	227,113	35,814,481	
8 mines shipped to Foreign smelters—						
Ores.....	3,352	57,913	192	5,876	333,719	
Copper concentrates.....	145,197	10,639,950	20,054	380,834	69,554,222	
Pyrite concentrates.....	76,581	177,450				38,203
Total.....	913,665	21,859,907	97,168	1,046,774	162,765,686	38,203

†Contained also 674,000 pounds of zinc.

*Contained also 1,730 pounds of cobalt, and 16,997 pounds of arsenic.

Table 53.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, 1928 and 1929

	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
SALARIED EMPLOYEES—						
Total.....	424	37	844,646	401	29	900,605
WAGE-EARNERS—						
Surface.....	2,471	25	5,919,663	2,536	2,277	7,598,150
Underground.....	1,820					
Total.....	4,291	25	5,919,663	4,813		7,598,150
Total.....	4,715	62	6,764,309	5,214	29	8,498,755

Table 54.—Wage-Earners in the Copper-Gold-Silver Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Under-ground			Surface	Under-ground		
January.....	1,288	1,650	297	3,235	1,528	2,023	449	4,000
February.....	1,390	1,643	299	3,332	1,597	2,087	454	4,138
March.....	1,536	1,534	297	3,367	1,624	2,026	425	4,075
April.....	1,640	1,573	292	3,505	1,588	2,058	445	4,091
May.....	1,707	1,698	303	3,708	1,804	2,151	452	4,407
June.....	1,922	1,712	316	3,950	1,863	2,185	486	4,534
July.....	1,969	1,648	334	3,951	1,883	2,198	477	4,558
August.....	1,967	1,681	363	4,011	1,900	2,273	474	4,647
September.....	1,856	1,791	369	4,016	1,994	2,319	484	4,797
October.....	1,846	1,855	371	4,072	1,828	2,344	471	4,643
November.....	1,599	1,902	348	3,849	1,750	2,308	482	4,540
December.....	1,519	1,932	335	3,786	1,482	2,132	450	4,064

Table 55.—Production of Gold in Canada by Provinces and by Sources, 1928 and 1929

Province	1928		1929	
	Fine ounces	Value	Fine ounces	Value
		\$		\$
NOVA SCOTIA—				
In gold bullion and in concentrates exported.....	1,290	26,667	2,687	55,545
QUEBEC—				
In blister copper and in ores exported.....	60,006	1,240,434	90,798	1,876,961
ONTARIO—				
Porcupine area—In gold bullion.....	978,172	20,220,609	932,709	19,280,805
In slugs exported.....	1,244	25,716	23	475
Kirkland lake area—In gold bullion.....	591,466	12,226,687	678,745	14,030,904
In slugs exported.....	331	6,842	759	15,690
Sudbury area—In matte and blister copper exported.....	3,850	79,587	7,802	161,282
Miscellaneous.....	3,371	69,685	2,229	46,078
Total.....	1,578,434	32,629,126	1,622,267	33,535,234
MANITOBA—				
In gold bullion.....	19,813	409,571	22,455	464,186
ALBERTA.....	68	1,406	5	103
BRITISH COLUMBIA—				
In alluvial gold.....	6,739	139,307	5,158	106,626
In gold bullion.....	16,157	333,995	17,609	364,010
In blister copper.....	31,057	642,005	18,405	380,465
In base bullion and in ores exported.....	142,664	2,949,127	113,032	2,336,579
Total.....	196,617	4,064,434	154,204	3,187,680
YUKON—				
In alluvial gold.....	34,116	705,240	35,678	737,530
In ores exported.....	248	5,127	214	4,424
Total.....	34,364	710,367	35,892	741,954
Total Canada.....	1,890,592	39,082,005	1,928,308	39,861,663

Table 56.—Production of Gold in Canada, 1858-1929

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		\$			\$			\$
1858.....	34,104	705,000	1882.....	60,288	1,246,268	1906.....	556,415	11,502,120
1859.....	78,129	1,615,072	1883.....	53,853	1,113,246	1907.....	405,517	8,382,780
1860.....	107,806	2,228,543	1884.....	51,202	1,058,439	1908.....	476,112	9,842,105
1861.....	128,973	2,666,118	1885.....	55,575	1,148,829	1909.....	453,865	9,382,230
1862.....	135,391	2,798,774	1886.....	70,782	1,463,196	1910.....	493,707	10,205,835
1863.....	202,498	4,186,011	1887.....	57,460	1,187,804	1911.....	473,159	9,781,077
1864.....	199,605	4,125,199	1888.....	53,145	1,093,610	1912.....	611,835	12,648,794
1865.....	192,898	3,987,562	1889.....	62,652	1,295,159	1913.....	802,973	16,598,923
1866.....	152,555	3,153,597	1890.....	55,620	1,149,776	1914.....	773,178	15,983,007
1867.....	145,775	3,013,431	1891.....	45,018	930,614	1915.....	918,056	18,977,901
1868.....	134,169	2,773,527	1892.....	43,905	907,601	1916.....	930,492	19,234,876
1869.....	102,720	2,123,405	1893.....	47,243	976,603	1917.....	738,831	15,272,892
1870.....	83,415	1,724,348	1894.....	54,600	1,128,688	1918.....	699,681	14,463,689
1871.....	105,187	2,174,412	1895.....	100,798	2,083,674	1919.....	766,764	15,850,423
1872.....	90,283	1,866,321	1896.....	133,262	2,754,774	1920.....	765,007	15,814,098
1873.....	74,346	1,536,871	1897.....	291,557	6,027,016	1921.....	926,329	19,148,920
1874.....	97,856	2,022,862	1898.....	666,386	13,775,420	1922.....	1,263,364	26,116,050
1875.....	130,300	2,693,533	1899.....	1,028,529	21,261,584	1923.....	1,233,341	25,495,421
1876.....	97,729	2,020,233	1900.....	1,350,057	27,908,153	1924.....	1,525,382	31,532,443
1877.....	94,304	1,949,444	1901.....	1,167,216	24,128,503	1925.....	1,735,735	35,880,826
1878.....	74,420	1,538,394	1902.....	1,032,161	21,336,667	1926.....	1,754,228	36,263,110
1879.....	76,547	1,582,358	1903.....	911,559	18,843,590	1927.....	1,852,785	38,300,464
1880.....	62,121	1,304,824	1904.....	796,374	16,462,517	1928.....	1,890,592	39,082,005
1881.....	63,524	1,313,153	1905.....	684,951	14,159,195	1929.....	1,928,308	39,861,663
						Total.....	35,515,555	734,171,770

*Calculated from the value \$1=0.048375 ounces.

Refined Gold.—Two refineries produced finegold in Canada in 1929, namely the Royal Mint, Ottawa, and the Consolidated Mining and Smelting Company of Canada, Limited, at Tadanae, near Trail, B.C. In 1929, the latter company produced 14,643 fine ounces. This gold was recovered principally from the gold in copper ores, but some was also recovered from silver-lead and dry ores. Small quantities of imported ores were also treated by this company.

Gold refined at the Royal Mint at Ottawa from the gold produced in Nova Scotia, Quebec Ontario, Manitoba, Alberta and British Columbia and from the alluvial gold obtained in the Yukon, amounted to 438,351 fine ounces, including a small amount recovered from scrap and crude gold from various sources. The total production in Canada of refined gold during 1929 was, therefore, 452,994 fine ounces.

Table 57.—Refined Gold Produced at Trail, B.C., 1920-1929*

(For years 1904 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Fine ounces	Year	Fine ounces
1920.....	42,636	1925.....	18,441
1921.....	56,297	1926.....	49,607
1922.....	18,940	1927.....	29,334
1923.....	11,113	1928.....	22,751
1924.....	23,412	1929.....	14,643

*Includes some gold derived from imported ores and from occasional shipments from Ontario, Manitoba, Alberta, and the Yukon.

Table 58.—Receipts at the Royal Mint, Ottawa, Ont., by Sources, 1928 and 1929

Source	1928			1929		
	Gross weight	Precious metal content		Gross weight	Precious metal content	
		Fine gold	Fine silver		Fine gold	Fine silver
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
Nova Scotia.....	1,585.81	1,289.86	77.33	2,927.88	2,686.77	131.67
New Brunswick.....						
Quebec.....	509.70	463.52	40.74	15,383.37	13,326.25	842.65
Ontario.....	1,537,294.54	1,217,622.04	199,470.15	412,057.63	328,556.13	54,067.83
Manitoba.....	44,350.96	15,037.18	1,272.48	68,923.47	25,309.12	2,948.32
Saskatchewan.....						
Alberta.....				5.68	5.23	0.37
British Columbia.....	3.33	20.06	71.08	39.87	24.13	12.14
Dominion of Canada Assay Office, Vancouver.....	92,051.40	76,131.20	11,914.42	67,023.52	54,060.96	7,839.23
Yukon.....				37.05	32.27	3.72
Jewellery and scrap, various sources.....	33,673.19	14,528.92	4,729.74	35,130.59	14,350.36	7,569.50
Foreign.....	25.20	16.92	6.99			
Total.....	1,709,494.13	1,325,112.70	217,582.93	601,529.06	438,351.22	73,415.43

Table 59.—Crude Bullion Received at Dominion Government Assay Office, Vancouver, B.C., 1920-1929

(For years 1908 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Weight before melting	Weight after melting	Net value	Year	Weight before melting	Weight after melting	Net value
	Ounces	Ounces	\$		Ounces	Ounces	\$
1920.....	150,869.17	147,718.25	2,499,174.41	1925.....	140,691.78	123,202.39	2,065,217.16
1921.....	163,070.56	160,803.48	2,834,499.61	1926.....	162,606.56	145,279.61	2,524,337.58
1922.....	129,891.63	125,758.41	2,105,989.64	1927.....	108,080.89	102,192.93	1,750,599.35
1923.....	129,043.63	124,546.48	2,051,369.65	1928.....	107,617.27	98,392.98	1,673,926.65
1924.....	114,041.96	107,569.15	1,850,373.74	1929.....	69,985.84	61,249.57	1,032,128.51

Table 60.—Quantity of Gold produced in Canada, by Provinces, 1919-1929

(For the years 1862 to 1918, see Mineral Production of Canada, 1928)

Year	Nova Scotia	Quebec	Ontario	Manitoba	Alberta	British Columbia	Yukon
	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.
1919.....	850	1,470	505,739	724	24	167,252	90,705
1920.....	690	955	564,995	781		124,808	72,773
1921.....	439	635	708,213	207	49	150,792	65,994
1922.....	1,042		1,000,340	156		207,370	54,456
1923.....	655	667	971,704	31		200,140	60,144
1924.....	1,047	883	1,241,728	1,180		245,719	34,825
1925.....	1,626	1,602	1,461,039	4,424		219,227	47,817
1926.....	1,678	3,680	1,497,215	188		225,866	25,601
1927.....	3,151	8,331	1,627,050	182	42	183,094	30,935
1928.....	1,290	60,006	1,578,434	19,813	68	196,617	34,364
1929.....	2,687	90,798	1,622,267	22,455	5	154,204	35,892

Table 61.—Value of Gold Produced in Canada, by Provinces, 1919-1929

(For the years 1862 to 1918 see Mineral Production of Canada, 1928)

Year	Nova Scotia	Quebec	Ontario	Manitoba	Alberta	British Columbia	Yukon
	\$	\$	\$	\$	\$	\$	\$
1919.....	17,571	30,388	10,454,553	14,966	500	3,457,406	1,875,039
1920.....	14,263	19,742	11,679,483	16,145		2,580,010	1,504,455
1921.....	9,075	13,127	14,640,062	4,279	1,013	3,117,147	1,364,217
1922.....	21,540		20,678,862	3,225		4,286,718	1,125,705
1923.....	13,540	13,788	20,086,904	641		4,137,261	1,243,287
1924.....	21,643	18,253	25,668,795	24,393		5,079,462	719,897
1925.....	33,612	33,116	30,202,357	91,452		4,531,824	988,465
1926.....	34,687	76,072	30,950,180	3,886		4,669,065	529,220
1927.....	65,137	172,217	33,634,108	3,762	868	3,784,889	639,483
1928.....	26,667	1,240,434	32,629,126	409,571	1,406	4,064,434	710,367
1929.....	55,545	1,876,961	33,535,234	464,186	103	3,187,680	741,954

Table 62.—Production of Gold, in British Columbia by Districts, 1928 and 1929

(From Annual Report of the Minister of Mines for British Columbia)

District and division	1928				1929			
	Gold alluvial*		Gold lode		Gold alluvial*		Gold lode	
	Ounces	Value	Ounces	Value	Ounces	Value	Ounces	Value
		\$		\$		\$		\$
Northwestern District (No. 1)—								
Atlin.....	3,174	53,958	193	3,990	2,408	40,936		
Stikine.....	29	493			38	646		
Liard.....	334	5,678			340	5,780		
Nass River.....			5,100	105,426			4,671	96,558
Portland Canal.....			130,304	2,693,618			96,676	1,998,467
Skeena.....	30	510	139	2,874	18	306	69	1,426
Queen Charlotte.....					9	153		
Bella Coola.....								
Northeastern District (No. 2)—								
Cariboo.....	2,287	38,879			2,495	42,415		
Quesnel.....	1,649	28,033			1,201	20,417		
Omineca.....	235	3,995	477	9,860	120	2,040	226	4,672
Peace River.....	200	3,400			120	2,040		
Central District (No. 3)—								
Nicola.....			1	21			794	16,413
Vernon.....			2	41				
Yale.....	20	340			20	340	1	21
Ashcroft.....								
Kamloops.....	15	255	157	3,246			128	2,646
Lillooet.....			7,730	159,793			5,061	104,620
Clinton.....	186	3,162			109	1,853		
Southern District (No. 4)—								
Grand Forks.....								
Greenwood.....			134	2,770			141	2,915
Osoyoos.....			11,843	244,816			14,217	293,891
Similkameen.....	242	4,114	5,265	108,837	75	1,275	5,924	122,460
Eastern District (No. 5)—								
Fort Steele.....	23	391	731	15,111	27	459	227	4,692
Windermere.....			3	62			2	41
Golden.....					3	51		
Ainsworth.....			148	3,059			96	1,984
Slocan.....			383	7,917			156	3,225
Slocan City.....			41	848				
Nelson.....			2,712	56,062			2,465	50,956
Arrow Lake.....								
Trail Creek.....			7,424	153,467			164	3,391
Revelstoke.....			1	21				
Trout Lake.....			7	145				
Lardeau.....			15	310			2	41
Western District (No. 6)—								
Nanaimo.....							25	517
Alberni.....							4	83
Clayoquot.....								
Quatsino.....								
Victoria.....								
New Westminster.....								
Vancouver.....			15,277	315,803			14,290	295,400
Total.....	8,424	143,208	188,087	3,888,097	6,983	118,711	145,339	3,004,419

*Alluvial gold is valued at \$17 an ounce, which is believed to be a fair average for the whole province.

Table 63.—Receipts from the Yukon, at the Dominion of Canada Assay Office, Vancouver, B.C., 1920-1929

(For years 1908 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Weight before melting	Net value	Average value	Year	Weight before melting	Net value	Average value
	Ounces	\$	\$		Ounces	\$	\$
1920.....	74,456.01	1,206,579	16.21	1925.....	61,096.43	977,624	16.00
1921.....	82,219.92	1,340,225	16.30	1926.....	32,686.16	537,822	16.46
1922.....	69,161.19	1,126,702	16.29	1927.....	39,436.44	649,402	16.47
1923.....	73,360.82	1,201,133	16.37	1928.....	42,993.43	693,765	16.13
1924.....	44,365.96	717,156	16.17	1929.....	7,970.97	120,826	15.16

Table 64.—Production of Alluvial Gold in the Yukon by Months, 1927-1929

(Gross weight of dust, nuggets, and bullion in ounces)

Month	1927	1928	1929
January.....	550.09	532.96	1,346.69
February.....	4.00	183.44	394.21
March.....	1,112.59	359.21	334.17
April.....	.....	465.49	607.02
May.....	973.34	686.79	567.84
June.....	5,480.34	5,189.72	5,898.27
July.....	4,335.22	5,692.05	5,013.00
August.....	8,695.88	6,589.03	6,633.90
September.....	6,604.03	10,846.02	8,074.13
October.....	6,584.82	5,383.91	8,063.48
November.....	2,116.05	4,023.29	5,526.79
December.....	2,016.09	2,693.46	2,138.50
Total.....	38,472.45	42,645.37	44,598.00

From 1898 to March 31, 1930, royalties to the extent of \$4,960,403 were collected on the gold production of the Yukon. The yearly amounts collected, as well as the annual production of gold as ascertained by the *Department of the Interior*, are shown below. The difference between these figures and those shown in the table of annual production, which are based on mint receipts of Yukon gold is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at \$15 per ounce, (2) the probability that, in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small production from lode mines.

Table 65.—Gold Production in the Yukon and the Royalty Collected, 1921-1930

(Supplied by the Mining Lands Branch of the Department of the Interior.)

(For years 1898 to 1920 see 1928 report on the Mineral production of Canada)

Fiscal year	Total gold production	Total exemption	Royalty collected on	Royalty paid
	\$	\$	\$	\$
Ending March, 1921.....	1,246,486	.....	1,246,486	31,273.76
Ending March, 1922.....	1,230,987	.....	1,230,987	30,774.68
Ending March, 1923.....	1,032,762	.....	1,032,762	25,819.04
Ending March, 1924.....	1,136,368	.....	1,136,368	28,409.23
Ending March, 1925.....	625,459	.....	625,459	15,636.48
Ending March, 1926.... Since 1902, the Dominion Government has..	879,819	.....	879,819	21,995.50
Ending March, 1927.... collected a royalty of 2½ per cent on all gold..	497,504	.....	497,504	12,437.64
Ending March, 1928.... produced; the Government for royalty pur..	568,221	.....	568,221	14,205.55
Ending March, 1929.... poses, places a nominal value of \$15 on each..	654,672	.....	654,672	16,366.79
Ending March, 1930.... crude ounce recovered.	657,537	.....	657,537	16,438.42

IMPORTS AND EXPORTS

Table 66.—Imports into Canada and Exports of Gold, 1927-1929

	1927	1928	1929
IMPORTS—	\$	\$	\$
Coin and bullion—			
Coins, British, Canadian and foreign gold coins.....	30,510,818	27,654,313	2,856,947
Gold bullion, in bars, blocks, ingots, drops, sheets or plates, unmanufactured....	745,820	925,612	889,541
Total.....	31,256,638	28,579,925	3,746,488
Gold, other—			
Bullion or fringe gold.....	31,076	47,537	37,401
Manufactures of gold and silver—			
Leaf.....	98,452	127,085	124,296
Sweepings.....	240	168	564
Manufactures, n.o.p.....	85,477	58,275	78,939
Electroplated ware.....	1,013,799	1,282,513	1,410,202

IMPORTS AND EXPORTS—Concluded

Table 66.—Imports into Canada and Exports of Gold, 1927-1929

	1927	1928	1929
IMPORTS—	\$	\$	\$
Gold, other—			
Medals of gold, silver or copper, and other metallic articles, actually bestowed as trophies or prizes, and received and accepted as honorary distinctions, and cups or other metallic prizes won in bona fide competitions.....	18,365	17,143	24,016
Total.....	1,247,409	1,532,721	1,675,418
EXPORTS—			
Coin and bullion—			
Gold coin—			
Canadian.....	1,005		25
Foreign.....	42,003,384	56,121,042	29,252,140
Gold bullion—			
Canadian.....	5,019,346	48,914,498	409,577
Foreign.....			
Total—Canadian.....	5,020,351	48,914,498	409,602
Foreign.....	42,003,384	56,121,042	29,252,140
Gold-bearing quartz, dust, nuggets and bullion obtained direct from mining operations.....	7,881,512	10,457,877	29,995,983
Jewellers' sweepings.....	336,081	436,939	423,642

WORLD OUTPUT

Table 67.—Comparative Figures of Gold Production, for the World, Africa, United States and Canada, 1898-1929

Year	*World's output	†Africa's output	*United States' output	Canada's output
	Fine ounces	Fine ounces	Fine ounces	Fine ounces
1898.....	13,904,363	3,823,207	3,118,398	666,386
1899.....	14,837,775	3,637,713	3,437,210	1,028,529
1900.....	12,315,135	348,761	3,829,897	1,350,057
1901.....	12,740,746	258,032	3,805,500	1,167,216
1902.....	14,354,680	1,718,921	3,870,000	1,032,161
1903.....	15,768,387	2,971,427	3,560,000	911,559
1904.....	16,780,913	3,770,996	3,892,480	796,374
1905.....	18,396,451	4,908,281	4,265,742	684,951
1906.....	19,471,080	5,793,159	4,565,333	556,415
1907.....	19,997,260	6,452,180	4,374,827	405,517
1908.....	21,430,438	7,057,100	4,574,340	476,112
1909.....	21,982,713	7,296,832	4,821,701	453,865
1910.....	22,022,180	7,531,386	4,657,017	493,707
1911.....	22,348,813	8,251,240	4,687,053	473,159
1912.....	22,549,335	9,108,792	4,520,719	611,885
1913.....	22,249,596	8,798,713	4,299,784	802,973
1914.....	21,240,416	8,396,068	4,572,976	773,178
1915.....	22,760,788	9,096,411	4,887,604	913,056
1916.....	22,107,669	9,296,964	4,479,057	930,492
1917.....	20,289,546	9,018,389	4,051,440	738,831
1918.....	18,556,920	8,418,379	3,320,784	699,681
1919.....	17,695,037	8,331,651	2,918,628	766,764
1920.....	16,205,029	8,158,455	2,476,166	765,007
1921.....	15,974,962	8,128,710	2,422,006	926,329
1922.....	15,451,945	7,009,858	2,289,235	1,263,364
1923.....	17,790,597	9,149,073	2,426,495	1,233,341
1924.....	19,031,001	9,575,040	2,446,338	1,525,382
1925.....	19,025,942	9,597,592	2,319,920	1,735,735
1926.....	19,349,118	9,954,762	2,238,616	1,754,228
1927.....	19,397,757	10,122,491	2,117,253	1,852,785
1928.....	19,755,622	10,354,264	2,144,720	1,890,592
1929.....	19,496,721	*11,384,905	2,056,629	1,928,308

* Figures taken from annual report of the Director of the Mint, Washington.

† From the Year Book of the Union of South Africa.

Table 68.—World Production of Gold, 1926-1929

(From the Annual Report of the Director of the Mint, Washington)

	1926	1927	1928	1929
NORTH AMERICA—	Fine ounces	Fine ounces	Fine ounces	Fine ounces
United States.....	2,238,616	2,117,253	2,144,720	2,056,629
Canada.....	1,754,228	1,844,544	1,890,592	1,928,308
Mexico.....	772,661	725,155	699,102	651,873
Total.....	4,765,505	4,686,972	4,734,414	4,636,810
(1) Central America and West Indies.....	87,076	72,563	60,469	53,212
SOUTH AMERICA—				
Argentina (2).....	2,419	967	968	1,000
Bolivia.....	332	241	506	1,499
Brazil.....	102,108	100,000	100,115	107,381
Chile.....	59,132 (2)	60,000	28,806	28,806
Colombia.....	71,658	72,563	40,323	48,375
Ecuador.....	62,486	64,242	74,572	67,328
Guiana—				
British.....	6,516	5,714	5,325	6,385
Dutch.....	7,526	7,684	5,498	2,975
French.....	45,235	48,354	45,460	46,183
Peru.....	120,241	92,656	66,904	122,138
Venezuela.....	30,642	39,366	48,257	43,206
Total.....	508,195	491,787	416,734	475,276
EUROPE—				
Austria.....	1,318	129	321	.....
Czechoslovakia.....	7,716 (2)	7,500	6,944	5,015
France.....	42,010	45,010	54,013	54,012
Germany.....	5,208 (2)	5,000	5,434	5,819
Great Britain.....	.....	.....	129	12
Greece.....	.....	482	482	482
Italy.....	1,704	2,154	1,865	1,543
Jugoslavia.....	10,384	12,410	14,468	18,455
Norway.....	.....	.....	.....	.....
Poland.....	.....	.....	.....	.....
Rumania.....	55,652	66,165	62,628	71,148
Russia.....	992,155	1,060,950 (2)	1,200,000 (2)	1,000,000
Spain.....	967	967	726	483
Sweden.....	14,789	14,789 (2)	14,000 (2)	10,000
Total.....	1,131,903	1,215,556	1,361,010	1,166,969
ASIA—				
British India.....	(2) 383,970	384,268	376,058	363,869
China.....	110,000 (2)	100,000 (2)	100,000 (2)	50,000
Chosen (Korea).....	190,620 (2)	190,000	166,412	141,667
East Indies—				
British.....	19,350	19,350	.....	.....
Dutch.....	115,354	113,071	110,242	107,899
Federated Malay States.....	14,475	10,706	18,693	24,431
Indo-China.....	321	321	257	514
Japan.....	307,862 (2)	308,000	334,061	(3) 334,061
Philippine Islds.....	91,242	79,314	106,641	160,626
Sarawak.....	243	243 (2)	200	1,405
Taiwan.....	9,035	(2) 9,000	9,012	(3) 9,012
Turkey.....	964	964	900	900
Total.....	1,243,436	1,215,237	1,222,476	1,194,384
OCEANIA—				
Australia—				
New South Wales.....	19,435	18,032	12,831	11,096
Northern Territory.....	140	174	100	44
Queensland.....	9,086	37,979	13,277	9,476
South Australia.....	758	418	532	643
Victoria.....	49,078	38,538	33,917	26,275
West Australia.....	437,343	408,353	393,408	377,176
Tasmania.....	4,166	4,860	3,603	5,597
Papua.....	6,388	6,150	55,573	See New Guinea
New Guinea—				
Australian.....	.....	.....	55,573	36,281
British (Papua).....	.....	.....	.....	1,729
New Zealand.....	(3) 125,777	129,519	118,714	116,848
Total.....	652,171	644,023	687,528	585,165
AFRICA—				
Ethiopia (Abyssinia).....	(2) 20,000	21,605	9,131	4,501
Algeria.....	.....	.....	.....	.....
Belgian Congo.....	132,201	125,417	138,116	172,838
Bechuanaland.....	4,296	3,807	1,748	1,725
British West Africa (Gold Coast, Ashanti, Nigeria).....	199,666	171,607	157,901	208,053
Egypt.....	643	64	64	64
French West Africa.....	9,966	6,848	3,279	4,147
Kenya Colony.....	779	655	814	845
Madagascar.....	9,870	10,352	7,169	6,012
Portuguese East Africa.....	9,127	9,521	4,239	375
Rhodesia—				
Northern.....	779	350	602	699
Southern.....	593,429	581,438	576,112	560,813
Southwest Africa.....	.....	984	542	377
Swaziland.....	1,309	1,135	347	90
Sudan.....	8,714	7,166	5,835	2,459
Tanganyika.....	7,202	8,179	12,828	9,581
Transvaal, Cape Colony and Natal.....	9,962,852	10,122,491	10,354,264	10,412,326
Total.....	10,960,833	11,071,619	11,272,991	11,384,905
Total for world.....	19,349,118	19,397,757	19,755,622	19,496,721

(1) Estimate based on United States imports of ore and bullion.

(2) Estimate based on other year's production.

(3) Amount exported.

CHAPTER THREE

THE SILVER MINING INDUSTRY IN CANADA

Including the Silver-Cobalt Mining Industry, the Silver-Lead-Zinc Mining Industry, and Commodity Statistics Tables on Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review.
2. The Silver-Cobalt Mining Industry.
3. The Silver-Lead-Zinc Mining Industry.
4. Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review

(a) *Definition of the Industry.*—Silver mining is not a distinct industry in Canada, as silver is found, as an ore, only in association with those of other commercially valuable metals; with lead and zinc, as in many of the western mines; with the cobalt and nickel arsenides of northern Ontario, and in copper and other metalliferous ore deposits. Silver is nearly always found alloyed or associated with both alluvial and lode golds from which it is recovered in the refining of the crude gold bullion. This precious metal is, therefore, a rather common constituent in many of our mineral deposits, especially in those of the non-ferrous ores, and its value as a mine product is often a deciding factor in the economical working of an ore body. It is the paramount value in the rich native silver-cobalt ores of Ontario, while in the silver-lead-zinc industry it is usually recovered as an important by-product. The mining and smelting of argentiferous lead and zinc ores are very important industries, especially in British Columbia, and the silver recovered from this type of ore is a distinct contribution to the mineral production of Canada. It is realized then, that the mining and metallurgy of silver bearing ores are closely interwoven with those of other important metals principally lead and zinc and in order to make a comprehensive survey of the Canadian silver production it is imperative to consider its various sources of origin.

(b) *Historical.*—History pertaining to early Canadian silver and lead mining is meagre. We find in Cape Breton, evidence of early colonial efforts to mine galena ores, and from the records of the French regime we find mention by Champlain of argentiferous galena on the east shore of Lake Temiskaming, this deposit being later worked under the name of the Wright mine. It is stated that early last century small shipments of galena ore were made to Europe from deposits on the east shore of Hudson's Bay. In Ontario, silver-bearing veins were found as early as 1846 in the vicinity of Thunder Bay on Lake Superior. It was not until 1866 that Thomas McFarlane discovered in this district high grade silver ore in important commercial quantities. This a sensational "find", was made on a small rocky island not more than 90 feet in diameter and located but a short distance off Thunder Cape. The property, later known as the Silver Islet mine, produced until 1884, the year of its abandonment, approximately \$3,250,000 in silver. Some of the other producing mines of this period in the Port Arthur district were the Silver Mountain, Beaver, Rabbit Mountain and Porcupine.

Construction of the Temiskaming and Northern Ontario railroad during 1903 was highly instrumental in the finding of one of the world's richest silver areas. Grading operations along what was then known as Long Lake in northern Ontario revealed veins possessing a mixture of unfamiliar minerals, leaves and wires of a white sectille metal were found on the surfaces of pinkish coated (erythrite) vein fillings. It was only after specimens of these "queer rocks" were sent south for identification and the announcement officially made of the discovery of important native silver and cobalt ores that the country became keenly interested. Silver discoveries and mine development in the South Lorraine and Gowganda areas followed shortly after the original finds at Cobalt and represent the results attained in the widened sphere of the prospecting activity subsequent to the first "boom" in Coleman township.

History is silent as to any important silver production or discoveries in the Prairie Provinces or Territories. Small amounts have been recorded as coming from either Manitoba or Alberta and chiefly represent the metal recovered in the refining of crude gold bullion. The dawn, or

perhaps more aptly put, the false dawn of the silver-lead mining industry in British Columbia reaches back into the early decades of placer prospecting. The gravel miners penetrating the unexplored upper waters of the auriferous streams eventually encountered widespread evidence of metalliferous deposits. Rich float found in the valley bottoms was often traced up the mountain sides to its source of origin and sometimes resulted in the discovery of potential mines. Early development and exploration was greatly delayed by lack of railroad facilities and it was not until late in the eighties that any appreciable production was registered. Small shipments aggregating \$37,925 were made in 1887 from various camps in the Kootenay district. It may be of interest, to note here, that the Monarch mine at Field, discovered in 1884, was a small shipper during 1887 and now after 45 years of intermittent operation has been reopened under sound financing and is again shipping silver-lead-zinc ores under much more modern and efficient mining methods. Active operations in the Ainsworth camp date from about 1888 and those in the Sandon-Silverton areas from about 1892. The discoveries of the North Star, Saint-Eugene and famous Sullivan deposits were made in East Kootenay during 1892 and 1893.

A rather common and outstanding characteristic of these usually complex ores is the intimate intermixture of the different sulphides, the clean separation of which is an essential to efficient smelting. Early methods of hand-sorting and crude jigging were for the most part futile, penalties devoured the miners' profits and the hill sides were left with deserted workings. Intensive research and untiring effort have largely solved this perplexing problem through the introduction of selective flotation and, in the almost continuous expansion and improvement of the great smelting, ore dressing, and other works of the Consolidated Mining and Smelting Company at Trail, we read the history of an immense and successful Canadian industry. Gold was discovered in the Yukon river as early as 1869 and we find in succeeding years a synchronous silver production which originated in the alluvial recoveries of the former crude metal. These silver values mounted to impressive figures during the height of the Klondike placer operations. Some argentiferous lode discoveries were made in the Yukon during 1899, but there appears to have been little, if any, production therefrom until 1910, in which year an output of 37,418 ounces of vein silver was recorded. In July, 1919, L. Beauvet made the first outstanding discovery of valuable silver-lead ores in commercial quantities. This find occurred at Keno Hill 40 miles northwest of the town of Mayo. Ore shipments from these deposits commenced during the winter of 1920-1921. It was during the latter year that the rich Sadie-Friendship vein was found. All ores and concentrates from this area are shipped to outside plants for smelting. Cost of transportation has always been a very important factor in the economical working of these mines. In the early days of the camp horse haulage of the ore to Mayo was nearly half the cost of shipping from mine to smelter, however, in 1922-23 the Treadwell-Yukon Company introduced caterpillar tractors reducing this item by nearly two-thirds. It is interesting to note that the frost zone in the Mayo district extends, at some mines, to a depth of over 400 feet.

(c) *Sources of Silver, Lead, Zinc, Cobalt and Arsenic.*—Statistics on the production of silver from Canadian ores include (a) silver contained in silver and gold bullion produced, (b) silver contained in blister copper or lead bullion made, and (c) silver estimated as recoverable from ores of all kinds exported for treatment in foreign smelters.

Figures on lead include lead contained in base bullion made at the Trail smelter, lead estimated as recoverable from silver-lead-zinc ores shipped from mines of the Yukon, and from the lead-zinc properties of Quebec, and including the pig lead made at Galetta in Ontario, with also small quantities of lead contained in silver-lead-bismuth bullion recovered by the smelters treating cobalt ores.

Most of Canada's zinc output is in the form of refined metal produced by the Consolidated Mining and Smelting Company at Trail, B.C. The remainder represents zinc estimated as recoverable from ores, concentrates and residues exported for treatment in foreign smelters.

For the past two decades the ores of the Cobalt district of Ontario have been the main source of the world's supply of cobalt, but since 1926, owing to the production of cobalt by the Union Minière du Haut Katanga, from Central African copper-bearing ores, Canada's production was reduced to less than half of the world's output.

Arsenic is produced in Canada from the cobalt-silver-nickel-arsenic ores of the Cobalt district by the smelter of the Deloro Smelting and Refining Company Limited, at Deloro, Ontario. Some arsenic is also contained in the concentrates shipped to the Tacoma smelter by the Nickel Plate gold mine of British Columbia, but owing to the low price prevailing during the past two years this company has had little or no return for the arsenic.

(d) *Importance of these metals.*—Lead production in Canada holds sixth place, silver ninth place, and zinc tenth place in point of value among the metals and minerals produced. In 1929 Canada ranked third among the world's silver-producing countries; Mexico produced 108.7 million ounces; and the United States 60 million ounces. In the production of lead Canada was surpassed by the United States, Mexico and Australia. In smelter output of zinc, the United States had the highest production of any country, being followed by Belgium, Poland, Germany, France, and Canada in the order named. In the production of cobalt, Canada and Central Africa produced about equal amounts. From 1904 to 1910 the cobalt production figures represent an estimate of the cobalt content of the ores shipped from the mines, a large part of which was not recovered. From 1911 until the present time cobalt production is computed by adding the cobalt content of all cobalt metal oxides and salts sold by the Ontario smelters to the cobalt paid for in ores and residues exported for treatment in foreign smelters, thus representing a true figure of Canada's cobalt production since that time.

Reliable world's figures on the production of arsenic are very difficult to obtain, but the best available information is shown in Table 85. Because of its low price and the instability of demand, smelters operating long distances from the markets do not attempt its complete recovery.

2. The Silver-Cobalt Mining Industry

Mining and milling only are considered in this chapter: smelting of the cobalt ores, in so far as Canadian operations are concerned, is treated in the chapter on "The Non-Ferrous Smelting and Refining Industry."

After the remarkable Silver Islet production, comparatively little silver was produced in Ontario until the discovery of the mineral wealth of the Cobalt area in 1903. From 1905, when the output of silver was over 2,000,000 ounces, the production increased rapidly until the peak year was reached in 1911. In that year Ontario's production of silver was 30,540,754 ounces. In the following year production declined to 29,000,000 ounces and thereafter followed a generally downward trend until 1921, when less than 10,000,000 ounces were reported; in 1929 production in Ontario amounted to 8,890,726 ounces.

Ontario is the only province producing cobalt and refined arsenic. Some of the older properties around Cobalt have been worked out, but other mines in South Lorrain, Gowganda and in the old Cobalt camp itself, assist in keeping production fairly constant. The increase in gold production also assists in Ontario's silver output, as the gold from the Porcupine and Kirkland Lake camps carries an average of 16 ounces of silver to every 100 ounces of gold. A small amount of silver is also obtained as a refinery by-product from the nickel-copper ores of the Sudbury district.

In 1929 there were 19 silver-cobalt mines producing, or shipping from old dumps. Of these 21 were operating in the Cobalt area, 3 in South Lorrain and 3 in the Gowganda district. The O'Brien mine was the principal silver producer in this group. Other large mines in order of their production were, Nipissing Miller Lake O'Brien, Mining Corporation, Castle-Tretheway, Keeley and Frontier Lorrain.

The Nipissing Mining Company, Limited, was the only mining company in Ontario producing refined silver in 1929. Other mines in the district shipped ore to the Nipissing mill, to the mill of the Cobalt Reduction Company, to the Deloro Smelting and Refining Company, and to foreign smelters.

Table 69.—Statistics of Silver-Cobalt Mine and Mill Operations in Canada, 1928 and 1929

	Unit of measure	1928	1929
Number of mines in operation.....		19	32
Ore mined.....	Tons	230,644	242,591
Ores treated.....	Tons	252,670	235,546
Tailings treated.....	Tons		
Concentrates produced.....	Tons	4,649	3,996
Quantity of material cyanided.....	Tons	63,592	45,421
Bullion recovered.....	Fine ounces	1,886,958	1,546,165
Bullion recovered by direct smelting.....	Fine ounces	1,815,661	1,367,063
Bullion sold.....	Fine ounces		
Net value of bullion.....	\$	1,055,485	736,294

Table 70.—Shipments of Ores, Concentrates and Residues from the Cobalt Camp, Ontario, 1928 and 1929

Kind	Quantity	Net value (a)	Metallic content paid for		
			Silver	Cobalt	Copper
1928	tons	\$	fine ounces	lb.	lb.
<i>To Canadian Smelters—</i>					
Ores.....	705	544,693	926,596	274,803	.....
Concentrates and residues.....	2,595	1,894,038	3,486,949	208,826	.....
<i>To Foreign Smelters—</i>					
Concentrates and residues.....	2,825	444,668	676,907	203,772	44,475
Total.....	6,125	2,883,399	5,099,452	687,401	44,475
1929					
<i>To Canadian Smelters—</i>					
Ores.....	576	624,786	1,381,029	280,043	.....
Concentrates.....	2,356	2,185,493	4,405,742	196,441	.....
<i>To Foreign Smelters—</i>					
Concentrates and residues.....	2,263	371,743	635,602	164,542	26,731
Total.....	5,195	3,182,022	6,422,373	641,026	26,731

(a) Net value is the actual amount received by the operator.

Table 71.—Capital Employed in the Silver-Cobalt Mining Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings and equipment.....	16,765,120	10,537,310
Cost of supplies and stock on hand.....	930,891	262,569
Cash, trading and operating accounts and bills receivable.....	4,331,672	5,020,556
Total.....	22,027,683	15,820,435

Table 72.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1928 and 1929

	1928		1929	
	Number	Salaries and wages	Number	Salaries and wages
SALARIED EMPLOYEES—		\$		\$
Total.....	94	246,284	96	235,450
WAGE-EARNERS—				
Surface.....	210		297	
Underground.....	692	1,563,182	648	1,296,883
Mill.....	170		108	
Total.....	1,072	1,563,182	1,053	1,296,883
Total.....	1,166	1,809,466	1,149	1,532,333

Table 73.—Wage-Earners in the Silver-Cobalt Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine			Total	Mine			Total
	Surface	Underground	Mill		Surface	Underground	Mill	
January.....	178	687	172	1,037	269	660	110	1,039
February.....	193	709	175	1,077	261	636	110	1,007
March.....	181	709	166	1,056	245	599	109	953
April.....	181	677	167	1,025	238	594	107	939
May.....	213	675	164	1,052	277	597	108	982
June.....	204	641	160	1,005	271	592	106	969
July.....	210	659	165	1,035	274	637	107	1,018
August.....	228	655	159	1,042	280	636	108	1,024
September.....	236	657	162	1,055	292	633	105	1,030
October.....	236	668	161	1,065	293	638	107	1,038
November.....	194	661	157	1,012	294	660	108	1,062
December.....	201	679	155	1,035	290	602	109	1,001

3. The Silver-Lead-Zinc Mining Industry

CANADA

Producing, concentrating, smelting and refining of ores of the silver-lead-zinc group is an industry that is fairly well confined to the province of British Columbia; but as already noted there are silver-lead properties in the Yukon, lead at the Galetta and Errington properties in Ontario and silver-lead-zinc at Notre Dame des Anges in Quebec.

The Consolidated Mining and Smelting Company, Limited, of Trail, B.C., in addition to buying ores and concentrates for the smelter, operates a large customs concentrator which is of great assistance to the smaller mines within a reasonable shipping distance.

QUEBEC

Mining or exploration of silver-lead-zinc ores in Quebec has been carried on at Notre Dame des Anges since the discovery of this deposit in 1910. Mineralization consists of an intimate mixture of argentiferous galena and zinc blend which occurs both massive and disseminated in a rather well defined fissure intersecting gneisses and metamorphic rocks of pre-Cambrian age. Several early attempts to concentrate this ore failed, but more recently, as the result of a selective flotation process, worked out by the Mines Branch, Ottawa, economic recovery of silver-lead-zinc has been successful. During 1929 there were 29,798 tons of lead and zinc concentrates shipped from this property to foreign smelters. Considerable development and exploration work was done during the year on an extensive system of lead-zinc quartz veins in Lemieux township, Gaspé.

ONTARIO

Lead and zinc mineralization is fairly common in certain sections of Ontario. Several years ago lead ores were mined and smelted in Frontenac and Hastings counties. At the present time the greater part of the Ontario lead production comes from the Kingdon mine at Galetta. All of these deposits possess more or less common characteristics; the veins are usually in or adjacent to crystalline limestones of the Grenville series, and the vein matter consists of calcite, galena and zinc blende. A distinctly different type of lead deposit is being developed at the Errington mine in the Sudbury field where ore deposition occurs in a major fault zone passing through slates and tuffs of pre-Cambrian age. The crushed zone is, in places, several hundred feet wide, development indicates that the ore occurs in a number of separate and often parallel shoots. Ore consists of quartz, carbonate, rock inclusions and massive iron pyrites; the last mineral has been replaced, in part, by zinc blende, galena and copper pyrites. An average assay of ore from the Ollier Stope in the Errington was 0.033 ounces gold, 2.08 ounces silver, 1.08 per cent copper, 1.20 per cent lead, and 6.4 per cent zinc. Mineral separation is by differential flotation and the concentrates are shipped to foreign plants for metal recoveries.

BRITISH COLUMBIA

In 1929 British Columbia held first place among the silver, lead and zinc producing provinces. Production of these three metals from the silver-lead ores of this province has increased very rapidly during the past few years and at the present time British Columbia contributes 43 per cent of Canada's total silver, 94 per cent of the lead, and 87 per cent of the zinc. In 1897 and 1901 five million ounce silver productions were recorded, the metal coming largely from the silver-lead ores of the Kootenays. A recession to two million ounces in 1911 was followed by an almost steady increase from that time until the present day. Factors contributing to this recent expansion of the industry include:—emergency war requirements; the successful application of flotation methods to complex silver-lead ores; heavy world-wide metal consumption; high lead-zinc-silver prices; and widespread mining activity, an activity especially pronounced at the Premier and Sullivan mines. During 1929 energetic development and exploration were carried on at the Premier; metal production for the year from this property amounted to 96,636 ounces of gold and 2,258,729 ounces of silver. The same company was very active throughout the year at the Porter-Idaho and Prosperity mines, the latter being brought into production in November. At Kimberley important extensions were made to the Sullivan concentrator increasing its capacity from 4,000 to 6,000 tons a day. Development at the mine progressed at a rate of 1,000 feet a month and more ore is being continually added to the already immense reserves. Total shipments of all classes of ore from this deposit, to the end of 1929, are estimated at 10,178,000 tons.

A 300-ton concentrator was constructed by the Base Metal Mining Corporation at the Monarch mine near Field, this plant commenced production before the end of the year. Outcrops of the Monarch ore bodies are situated on the precipitous face of a mountain almost 800 feet vertically above the Canadian Pacific Railway. Principal development is on the west deposit which has been explored for a length of 850 feet revealing continuous ore throughout. Thickness of ore varies from 20 to 40 feet as exposed in raises. Deposits lie in flattened troughs of limestone and average 26 per cent combined metals in the proportion of about 14 per cent lead and 12 per cent zinc, the silver content is estimated roughly at 2 ounces per ton, ore minerals are supposed to be remarkably uniform in distribution.

In addition to the Trail silver production there is a large tonnage of British Columbia argentiferous ores shipped to American plants for metal recoveries. This is mined chiefly along the coast and consists largely of sulphides from which copper and gold extractions are of prime importance.

DISTRICT OF MACKENZIE

Deposits of lead ore situated about 32 miles southwest of Fort Resolution on Great Slave Lake were actively explored in 1929 by the Atlas Exploration Company. It is stated that the occurrences resemble those of the lead-zinc deposits found in Missouri and other Mississippi valley states. The Consolidated Mining and Smelting Company of Canada is an associate in this development.

YUKON

In the Yukon the Keno Hill district is the principal producer of silver and lead. According to a report given to the *Mining Lands Branch* of the Department of the Interior by the Gold Commissioner of the Yukon, it has been shown that ore values continue with depth. In 1929 nine mines were reported as having shipped ores and concentrates. The Treadwell-Yukon Company, the largest producer in the district, completed a concentrator in the summer of 1925 that has worked to full capacity since it was built. Ores from neighbouring mines are treated in the mill, and this feature is much appreciated by the smaller operators who have thus been able to continue development work with the proceeds from the sales of their ores.

Table 74.—Shipments of Lead Ores and Concentrates from Canadian Mines, 1920-1929

(For years 1913 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Shipment		Lead content in pounds	Silver content in ounces
	Tons	Value		
1920.....	69,493	2,985,848	36,325,507	2,882,178
1921.....	15,256	671,313	9,517,616	989,374
1922.....	27,203	1,803,575	21,335,850	2,163,637
1923.....	76,886	4,692,755	66,770,926	3,745,129
1924.....	153,396	12,290,699	180,187,124	4,348,243
1925.....	208,588	15,420,756	237,675,311	6,024,213
1926.....	255,048	17,546,728	273,963,827	8,616,164
1927.....	275,328	13,044,514	308,903,620	8,831,840
1928.....	255,944	12,178,879	322,239,859	10,287,591
1929.....	258,203	15,990,117	328,877,236	10,177,926

Table 75.—Shipments of Zinc Ores and Concentrates from Canadian Mines, 1820-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Shipments		Metallic zinc shipped	Year	Shipments		Metallic zinc shipped
	Tons	Value			Tons	Value	
		\$	Pounds			\$	Pounds
1920.....	249,136	1,157,844	91,033,202	1925.....	173,172	6,481,930	153,980,628
1921.....	297,406	1,498,716	98,799,093	1926.....	242,967	8,643,306	183,393,028
1922.....	356,096	2,357,849	102,975,964	1927.....	204,823	4,383,586	196,210,320
1923.....	279,229	1,853,114	96,148,734	1928.....	310,255	4,715,452	250,476,679
1924.....	191,369	4,310,271	129,643,631	1929.....	289,103	6,522,225	283,143,748

Table 76.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry, in Canada, 1928 and 1929

Production	Quebec and Ontario	British Columbia	Yukon	Canada
1928	Tons	Tons	Tons	Tons
Ore mined.....	320,230	1,729,883	47,066	2,097,179
Ore milled.....	324,290	1,840,252	44,492	2,209,034
Concentrates produced—lead.....	11,804	210,461	4,876	226,641
Concentrates produced—zinc.....	27,933	213,856	.....	241,789
Concentrates produced—copper.....	716	.....	.....	716
1929				
Ore mined.....	263,611	1,899,534	45,125	2,208,270
Ore milled.....	309,315	2,000,722	42,402	2,352,439
Concentrates produced—lead.....	9,189	210,051	5,942	225,162
Concentrates produced—zinc.....	29,338	242,479	.....	271,817
Concentrates produced—copper.....	3,245	.....	.....	3,245

Table 77.—Products Shipped by Silver-Lead-Zinc Mines in Canada, 1928 and 1929

Location of mines	No. of mines shipping	Products shipped	Quantity shipped	Net value at shipping point	Total metal content as determined by settlement assay				
					Gold	Silver	Lead	Zinc	Copper
Canada 1928			Tons	\$	Oz.	Oz.	Lb.	Lb.	Lb.
Quebec and Ontario.	3	Lead ore.....	.....	.....	.....	.....	.....	.....	.....
		Lead concentrates..	11,301	880,729	4,939	622,889	13,315,520	715,804	.....
		Zinc concentrates..	25,266	837,703	2,319	155,455	201,510	25,159,052	.....
		Copper concentrates	716	17,570	122	7,045	.....	.....	180,546
		Total.....	37,283	1,736,002	7,380	785,389	13,517,030	25,874,856	180,546
British Columbia...	86	Lead ore.....	27,130	618,812	1,477	838,745	13,341,062	2,379,353	.....
		Lead concentrates..	211,024	9,119,639	1,252	6,055,889	288,366,137	19,734,841	.....
		Zinc ore.....	70,291	79,653	7	118,459	10,867,555	17,740,782	.....
		Zinc concentrates..	214,698	3,798,096	398	674,115	14,434,944	207,576,845	.....
		Dry ore.....	19,009	148,554	1,111	301,793	64,392	80	.....
		Total.....	542,152	13,764,754	4,245	7,989,001	327,074,090	247,431,901	.....
Yukon.....	12	Lead ore.....	2,914	543,411	197	925,752	3,258,037	.....	1,346
		Lead concentrates..	3,575	1,016,288	51	1,844,316	3,959,103	.....	83,002
		Dry ore.....	297	63,000	.....	127,825	437,556	.....	.....
		Total.....	6,786	1,622,699	248	2,897,893	7,654,696	.....	84,348
Canada.....	101	.....	586,221	17,123,455	11,873	11,672,283	348,245,816	273,306,757	264,894
Canada 1929									
Quebec and Ontario.	3	Lead ore.....	.....	.....	.....	.....	.....	.....	.....
		Lead concentrates..	9,247	566,960	3,105	382,833	10,350,282	.....	48,098
		Zinc concentrates..	31,127	806,556	1,590	140,976	371,840	30,150,566	.....
		Copper concentrates	3,277	130,534	857	39,599	.....	.....	996,781
		Total.....	43,651	1,504,050	5,552	563,408	10,722,122	30,150,566	1,044,879
British Columbia...	89	Lead ore.....	20,556	783,957	684	909,948	11,380,305	2,271,267	.....
		Lead concentrates..	220,546	12,383,385	1,296	5,546,894	298,146,118	24,353,427	1,023
		Zinc ore.....	2,752	50,002	22	22,512	303,584	1,403,502	.....
		Zinc concentrates..	255,224	5,635,667	97	592,413	18,109,563	251,589,680	.....
		Dry ore.....	19,008	105,213	117	252,051	.....	.....	.....
		Total.....	518,086	18,990,224	2,216	7,323,818	327,939,570	279,617,876	1,023
Yukon.....	9	Lead ore.....	2,687	659,595	45	1,028,668	2,843,660	18,805	14,086
		Lead concentrates..	5,167	1,594,220	170	2,309,583	6,156,871	.....	97,049
		Dry ore.....	.....	.....	.....	.....	.....	.....	.....
		Total.....	7,854	2,253,815	215	3,338,251	9,000,531	18,805	112,026
Canada.....	101	.....	569,591	22,748,089	7,983	11,225,477	347,662,223	309,787,247	1,157,928

Table 78.—Destination of Shipments from Silver-Lead-Zinc Mines in Canada, 1928 and 1929

Product shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assay				
			Gold	Silver	Lead	Zinc	Copper
1928		\$	Oz.	Oz.	Lb.	Lb.	Lb.
<i>To Canadian Smelters—</i>							
Lead ore.....	26,975	607,787	1,477	818,003	13,317,453	2,379,353	.....
Lead concentrates.....	215,431	9,382,935	1,252	6,055,889	294,948,527	19,734,841	.....
Zinc ore.....	70,291	79,653	7	118,459	10,867,555	17,740,782	.....
Zinc concentrates.....	214,735	3,799,758	400	674,239	14,434,944	207,612,371	.....
Dry ore.....	19,009	148,554	1,111	301,793	64,392	80	.....
Total.....	546,441	14,018,657	4,247	7,968,383	333,632,871	247,467,427	.....
<i>To Foreign Smelters—</i>							
Lead ore.....	3,069	554,436	197	946,494	3,281,646	.....	1,346
Lead concentrates.....	10,469	1,633,721	4,990	2,467,205	10,692,233	715,804	83,002
Zinc ore.....	.....	.....	.....	.....	.....	.....	.....
Zinc concentrates.....	25,229	836,041	2,317	155,331	201,510	25,123,526	.....
Dry ore.....	297	63,000	.....	127,825	437,556	.....	.....
Copper concentrates.....	716	17,570	122	7,045	.....	.....	180,546
Total.....	39,780	3,104,768	7,626	3,703,900	14,612,945	25,839,330	264,894
1929							
<i>To Canadian Smelters—</i>							
Lead ore.....	20,529	782,200	684	906,108	11,370,340	2,271,267	.....
Lead concentrates.....	222,226	12,506,654	518	5,503,611	301,462,774	24,353,427	1,023
Zinc ore.....	2,752	50,002	22	22,512	303,584	1,403,502	.....
Zinc concentrates.....	255,224	5,665,667	97	592,413	18,109,563	251,589,680	.....
Dry ore.....	19,008	105,213	117	252,051	.....	.....	.....
Total.....	519,739	19,109,736	1,438	7,276,695	331,246,261	279,617,876	1,023
<i>To Foreign Smelters—</i>							
Lead ore.....	2,714	661,352	45	1,032,508	2,853,625	18,805	14,086
Lead concentrates.....	12,734	2,039,911	4,053	2,735,699	13,190,497	.....	146,038
Zinc ore.....	.....	.....	.....	.....	.....	.....	.....
Zinc concentrates.....	31,127	806,556	1,590	140,976	371,840	30,150,566	.....
Dry ore.....	.....	.....	.....	.....	.....	.....	.....
Copper concentrates.....	3,277	130,534	857	39,599	.....	.....	996,781
Total.....	49,852	3,638,353	6,545	3,948,782	16,415,962	30,169,371	1,156,905

Table 79.—Capital Employed in the Silver-Lead-Zinc Mining Industry in Canada, 1928 and 1929

Province	Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
1928	\$	\$	\$	\$
Nova Scotia and Quebec.....	1,211,695	60,167	862,285	2,134,147
Ontario.....	4,701,986	175,412	405,505	5,282,903
British Columbia.....	25,654,196	1,260,823	639,221	27,554,240
Yukon.....	2,782,769	796,940	343,893	3,923,602
Canada.....	34,350,646	2,293,342	2,250,904	38,894,892
1929				
Nova Scotia and Quebec.....	5,945,159	63,632	992,751	7,001,542
Ontario.....	6,692,029	187,106	276,069	7,155,204
British Columbia.....	30,537,808	1,454,444	850,661	32,842,913
Yukon.....	2,697,390	852,355	124,257	3,574,002
Canada.....	45,772,386	2,557,537	2,243,738	50,573,661

Table 80.—Employees, Salaries and Wages in the Silver-Lead-Zinc Mining Industry in Canada, 1928 and 1929

Province	1928						1929					
	On salary	Mine		Mill	Total	Salaries and wages	On salary	Mine		Mill	Total	Salaries and wages
		Surface	Under-ground					Surface	Under-ground			
Nova Scotia and Quebec.....	18	122	143	21	304	\$ 354,378	27	123	139	21	310	\$ 336,959
Ontario.....	48	221	311	31	611	624,338	42	92	246	35	415	713,004
British Columbia.....	222	849	1,032	475	2,578	4,116,029	290	1,021	1,357	552	3,220	4,875,169
Yukon.....	14	76	86	11	187	436,889	12	100	84	12	208	557,260
Canada.....	302	1,268	1,572	538	3,680	5,531,634	371	1,336	1,826	620	4,153	6,482,392

Table 81.—Wage-Earners in the Silver-Lead-Zinc Mining Industry in Canada, by Months, 1928 and 1929

Month	1928				1929			
	Surface	Under-ground	Mill	Total	Surface	Under-ground	Mill	Total
January.....	792	1,322	433	2,547	870	1,588	481	2,939
February.....	859	1,311	433	2,603	898	1,511	491	2,900
March.....	922	1,365	439	2,726	935	1,572	506	3,013
April.....	955	1,434	458	2,847	1,002	1,512	495	3,009
May.....	1,135	1,429	496	3,060	1,158	1,612	550	3,320
June.....	1,181	1,439	517	3,137	1,307	1,725	602	3,634
July.....	1,324	1,474	530	3,328	1,375	1,720	645	3,740
August.....	1,409	1,446	542	3,397	1,352	1,693	647	3,692
September.....	1,410	1,471	545	3,426	1,328	1,652	597	3,577
October.....	1,385	1,563	577	3,525	1,235	1,715	625	3,575
November.....	1,240	1,492	554	3,286	1,033	1,711	582	3,326
December.....	1,034	1,487	545	3,066	932	1,580	510	3,022

4.—Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

ARSENIC

The greater part of the Canadian production of arsenic is recovered as a by-product in the treatment of the Temiskaming cobalt ores in Ontario metallurgical plants. In British Columbia auriferous arsenical concentrates shipped from the Nickel Plate mine to the Tacoma smelter constitute the source of the arsenic production in this province. The United States and Mexico together recover probably more than two-thirds of all the arsenic produced annually in the world and this, together with imports from other countries is all consumed in the United States.

Principal uses of white arsenic are in the manufacture of insecticides, weed killers, glass, cattle and sheep dips, wood preservatives, pigments and leather. In the southern states arsenic in the form of calcium arsenate is used in very large quantities for bollweevil control and in Canada experiments have been made in the dusting of forests with arsenic in an attempt to lessen the ravages of insect life.

Table 82.—Production of Arsenic in Canada, 1920-1929

(For production from 1885-1919, see Annual Report Mineral Production 1928)

Year	Arsenic in ore		White arsenic		Year	Arsenic in ore		White arsenic	
	tons	\$	tons	\$		tons	\$	tons	\$
1920.....	628	22,231	1,831	425,617	1925.....	714	21,513	1,003	108,789
1921.....	518	18,097	1,491	233,763	1926.....	545	12,687	1,992	134,124
1922.....	518	21,097	2,058	299,940	1927.....	667	15,644	2,447	196,335
1923.....	631	44,030	2,579	582,785	1928.....	708	16,539	2,008	176,513
1924.....	513	39,185	1,798	309,108	1929.....	766	17,314	1,849	154,006

Table 83.—Production, Exports and Imports of Arsenic, (As₂O₃), for Canada, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
PRODUCTION—						
From arsenical concentrates exported. lb.	1,333,421	15,644	1,416,805	16,539	1,531,218	17,314
White arsenic..... lb.	4,894,547	196,335	4,015,418	176,513	3,698,870	154,006
Total lb.	6,227,968	211,979	5,432,223	193,052	5,230,088	171,320
EXPORTS—						
Arsenic, As ₂ O ₃ lb.	3,856,600	124,823	3,191,900	122,106	3,167,300	123,398
IMPORTS—						
White arsenic..... lb.	286,377	11,833	333,113	13,976	123,224	5,341
Sulphide of arsenic..... lb.	16,245	1,593	94,380	5,566	18,295	1,865
Arsenate of soda..... lb.	25,148	4,024	360	83	1,456	156

Table 84.—Monthly Average Prices of Arsenic, 1927-1929

(From Engineering and Mining World)

Month	New York, in cents per pound		
	1927	1928	1929 (a)
January.....	3-50	4-00	4-5
February.....	3-75	4-00	4-5
March.....	3-75	4-00	4-5
April.....	3-75	4-00	4-5
May.....	3-75	4-00	4-5
June.....	3-75	4-00	4-5
July.....	3-75	4-00	4-5
August.....	4-00	4-00	4-5
September.....	4-00	4-00	4-5
October.....	4-00	4-00	4-5
November.....	4-00	4-00	4-5
December.....	4-00	4-00	4-5
Average.....	3-83	4-00	4-5

(a) The 1929 prices are from "Canadian Chemistry and Metallurgy."

Table 85—World Production of Arsenic Ore and White Arsenic, 1922-1928, in metric tons.

(Compiled by L. M. Jones, of the Bureau of Mines Washington, D.C., U.S.A.)

Country and product	1922	1923	1924	1925	1926	1927	1928
Algeria:							
Arsenate of lead—							
Gross weight.....	160	2,270	9,335	6,750	3,665	2,482	1,201
Arsenic content.....	34	409	1,587	1,215	733	546	300
Australia:							
New South Wales—							
Ore and concentrates.....	1	11,677	4,487	3,400	21,796	755	5,924
White arsenic.....	296	367	328	301	202	1	50
Queensland—							
Ore.....	1	1	1	1,133	828	71	.....
White arsenic.....	406	620	573	.....	.....	.....	.....
South Australia—							
Ore—							
Gross weight.....	.....	.....	69	102	.....	.....	.....
Arsenic content.....	.....	.....	1	1	.....	.....	.....
Victoria—							
White arsenic.....	1	1,036	437	1	1	1	1
Western Australia—							
Ore ^{2,3}	.....	.....	.....	.....	.....	.....	.....
Gross weight.....	1,092	.....	.....	.....	.....	.....	.....
Arsenic content.....	1	.....	.....	.....	.....	.....	.....
Austria:							
Ore ^{3,4}							
Gross weight.....	.....	.....	560	89	.....	.....	.....
Arsenic content.....	.....	.....	40	15	.....	.....	.....
Arsenic content of gold ores.....	103	136	216	237	155	14	.....
Belgium:							
White arsenic.....	1,008	1,380	1,850	1	1	1	1
Brazil:							
White arsenic.....	154	162	146	1	51	1	1
Canada:							
White arsenic.....	1,867	2,340	1,631	910	1,807	2,220	1,821
Arsenic content of ores and concentrates ^{2,3}	470	572	465	648	495	605	643

Table 85.—World Production of Arsenic Ore and White Arsenic, 1922-1928, in metric tons—Concluded

(Compiled by L. M. Jones, of the Bureau of Mines, Washington, D.C., U.S.A.)

Country and product	1922	1923	1924	1925	1926	1927	1928
China:							
Ore ^{2,3}	549	413	472	395	1	1	1
White arsenic ^{2,3}	30	176	237	94	1	1	1
Chosen:							
Ore.....	56	26		1			
White arsenic.....	1	95		2,3107			
Czechoslovakia:							
Ore—							
Gross weight.....	1	24	217	34	4	13	6
Arsenic content.....	1	1	1	1	1	3	1
France:							
Ore.....	4,465	10,022	14,029	30,349	23,256	55,800	74,720
White arsenic.....	266	815	802	2,217	2,096	1	1
Germany:							
Ore and concentrates ⁴ —							
Gross weight.....	8,750	10,273	10,818	6,626	3,930	4,710	4,373
Arsenic content.....	2,958	3,363	3,499	2,085	1,353	1,639	1,499
Great Britain:							
Ore.....	360	741	304	11		81	
White arsenic and arsenic soot.....	994	1,631	3,258	2,586	1,693	1,358	1,314
Greece:							
White arsenic.....	967	1,176	1,096	423	1,143	1,036	709
Italy:							
Ore—							
Gross weight.....	450	206	147	4	200	81	1
Arsenic content.....	81	46	33	1	35	20	1
Japan:							
Ore.....	2,295	64,245	7,416	1	1	1	1
White arsenic.....	1,922	4,287	3,703	3,485	1,035	1,713	1,829
Mexico:							
White arsenic.....	7272	1,402	2,551	7,507	6,458	11,332	12,933
Norway:							
Ore—							
Gross weight.....		577					
Arsenic content.....		149					
Peru:							
Ore.....	1	232		1			
Arsenic.....	1	115		119			
Portugal:							
Ore.....	106	160	279	76	7	47	155
White arsenic.....	604	887	874	1,092	354	1	1
Rhodesia, Southern:							
Ore—							
Gross weight.....	451	774	533	170	49	38	102
Arsenic content.....	1	1	1	1	1	1	
Spain:							
Ore—							
Gross weight.....					190	186	
Arsenic content.....					29	28	
Sweden:							
Ore—							
Gross weight.....			80	110	13,149	22,100	22,728
Arsenic content.....			19	21	2,478	4,420	4,546
Switzerland:							
Ore—							
Gross weight.....	10	100	1	1	1		
Arsenic content.....	1	1	1	1	1		
Turkey:							
Ore—							
Gross weight.....	10200	1	1	1	1		
Arsenic content.....	1	1	1	1	1		
Union of South Africa:							
White arsenic.....	3	5	102	33	38	53	17
United States:							
White arsenic.....	9,096	12,946	13,111	11,174	10,709	10,487	10,675

¹Data not available.²Exclusive of output of Ottery Mine, for which data are not available.³Exports.⁴Exclusive of arsenical gold ores worked primarily for their gold and silver content.⁵Data relate to concentrates produced and ore sold without concentration.⁶Incomplete figures, output of principal mines only.⁷Figures of Mexican Government. The Penoles Co. reports 335 tons shipped.⁸Content of ore.⁹White arsenic exported by the Anglo-French Ticapampa Silver Mining Co. (Ltd.)¹⁰Year ended Oct. 31.¹¹Production reported, but figures not available for publication.

COBALT

Production figures for Canada include the cobalt content of the various cobalt products sold by the Ontario smelters and the cobalt content of the ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

During the past few years Canada's production of cobalt decreased sharply in contrast to the totals for earlier years. This was due largely to new competition in the world's markets arising from the development of properties in Central Africa by the Union Minière du Haut Katanga. Cobalt from this source, computed in terms of the cobalt content of metal, oxides and salts marketed during the year amounted in 1929 to 1,560,832 pounds as compared with 1,008,000 pounds in 1928.

Since the discovery of the Cobalt camp in 1903, by far the greater part of the world's supply of cobalt has been derived from the treatment of ores mined in that area. Two companies, the Coniagas Reduction Company of Thorold, Ontario, (closed down in 1926) and the Deloro Smelting and Refining Company, Limited, at Deloro, Ontario, developed processes for the recovery of cobalt from these ores. A brief outline of the process follows:—

Reduction of the ore in a blast furnace produces a speiss containing silver, cobalt, nickel, a small amount of iron and other metals. The speiss is roasted to free it from arsenic; then chloridized and leached with sulphuric acid to extract the copper, and cyanided to dissolve the silver. Silver in the cyanide solution is precipitated by means of aluminium dust. The "speiss residues" remaining are treated for the recovery of cobalt and nickel in the form of oxides. In some cases the speiss residues are exported.

Cobalt oxide is marketed either as black or gray oxide; the black oxide contains about 70 per cent cobalt metal and the gray, about 75 per cent cobalt metal. Gray oxide is made by giving the black oxide a slight roast in a reducing atmosphere in a reverberatory furnace. Cobalt salts of various kinds are also made, and if the pure metal is required, the black oxide is reduced in the reverberatory furnace using charcoal as the reducing agent.

The market for cobalt which was very poor in 1915 gradually improved during the war. No quotations on the New York market were available during 1918, 1919 and 1920. During 1921 the quotations given in the *Engineering and Mining Journal* ranged from \$3 to \$3.50 per pound; the former value was used in computing the annual production values. In 1922 the average price \$3.25 per pound, was used. In 1923, the quotation, \$2.85 was used, but from 1924 to date the values given in the report have been based on the returns actually received by the operators for the products sold. In 1929 the market quotations for cobalt were: metal, \$5.52 per pound; cobalt oxide, \$2.10 per pound.

A bounty of 6 cents a pound on the metallic content of cobalt and nickel oxides was paid by the Ontario government from 1907 to 1917.

An increase in consumption of cobalt during recent years is due largely to the industrial application of cobalt alloys, especially stellite, cobalt magnet steels and cobalt-tungsten carbides, Konel metal, a new alloy containing Nickel 73 per cent, Cobalt 17 per cent, and ferrotitanium 10 per cent, is reported by the Westinghouse Company. It is at present used for filaments in radio tubes. This alloy possesses an ultimate strength of 66,000 pounds at 600 degrees C. or twice that of chrome steel at the same temperature.

An historical summary of the production in Canada which dates from the year 1904 is shown in the following table. For the years 1904 to 1910 inclusive, the figures given were prepared by the Ontario Bureau of Mines, and represent the estimated cobalt content of the ores shipped from the mines. From 1911 to date, the quantities given are the cobalt content of all smelter products sold or shipped, such as cobalt metal, the oxides, mixed oxides and residues, etc.

Table 86.—*Production of Cobalt from Canadian Ores, 1904-1929

Year	Pounds	Year	Pounds	Year	Pounds
1904.....	32,000	1913.....	865,937	1922.....	616,088
1905.....	236,000	1914.....	871,891	1923.....	760,105
		1915.....	504,212	1924.....	948,704
1906.....	642,000			1925.....	1,116,492
1907.....	1,478,000	1916.....	840,536		
1908.....	2,448,000	1917.....	1,079,572	1926.....	664,778
1909.....	3,066,000	1918.....	737,157	1927.....	880,590
1910.....	2,196,000	1919.....	530,371	1928.....	956,590
		1920.....	546,023	1929.....	929,415
1911.....	1,704,000			Total	25,565,540
1912.....	663,093	1921.....	251,986		

*See preceding paragraph.

Table 87.—Production in Canada and Exports of Cobalt, 1927-1929

	1927		1928		1929	
	Pounds	\$	Pounds	\$	Pounds	\$
PRODUCTION— Cobalt, computed as cobalt in metal, oxides and salts sold, and in ores and residues exported.....	880,590	1,764,534	956,590	1,672,320	929,415	1,801,915
EXPORTS— Cobalt alloys, cobalt metallies, cobalt oxides, cobalt salts and cobalt ores.....		1,678,468		1,734,461		1,786,163

Table 88.—Imports of Cobalt into the United States, 1920-1929

(From *The Mineral Industry*, 1929)

Year	Ore		Cobalt		Zaffer		Oxide	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
1920.....	13,039	\$ 4,794	143,603	\$ 326,864	220	\$ 14	202,724	\$ 399,605
1921.....	7,657	3,235	38,442	105,539			184,003	342,426
1922.....	5,195	7,075	126,364	321,396			217,530	435,895
1923.....	58,719	56,326	225,639	552,434			258,574	511,903
1924.....	28,786	37,276	118,952	264,935			226,703	440,898
1925.....	34,782	31,320	198,669	422,185			287,265	546,292
1926.....	154,468	55,820	387,076	820,873	110	40	333,132	632,478
1927.....	60,382	3,019	407,198	841,442			369,747	703,608
1928.....			(a) 643,315	1,173,496			364,154	692,753
1929.....	434,443	51,862	806,640	1,743,465			475,928	884,873

(a) Ore and metal.

Table 89.—World Production of Cobalt, 1925-1929

(From "The Mineral Industry of the British Empire"—"Imperial Institute")

	1925	1926	1927	1928	1929
BRITISH EMPIRE	Pounds	Pounds	Pounds	Pounds	Pounds
Canada (a).....	1,116,528	664,832	880,544	956,592	929,376
Australia (b).....	201,600	60,480		17,360	44,800
Union of South Africa (Ore).....					336
FOREIGN COUNTRIES					
Belgian Congo.....	428,400	792,960	795,200	1,008,000	1,560,836
Chile.....			784	3,696	(c)
Germany (Saxony).....	15,456	(c)			
New Caledonia.....	32,152		173,264	(c)	(c)

(a) Metal recovered from smelter products, including cobalt contained in cobalt residues exported.

(b) Metal content of concentrates.

(c) Information not available.

SILVER

For many years past the world's output of silver has been obtained chiefly from gold bullion and as a growing by-product in the refining of lead, copper, zinc, and other base metals. There is still, however, in Canada, an important production from the true silver ores as mined in the Cobalt area. Silver declined in price steadily during 1929 and authoritative opinion as to the reasons for this recession is varied. Market saturation from the by-product silver recoveries of the expanding base metal industries, demonetized metal, and political unrest in the Far East are suggested as possible causes. Increased utilization of silver in the trades and arts is being advocated as a stimulus to these abnormally low silver values.

Production—SPECIAL NOTE.—Prior to 1922, the method used in compiling the statistics on the silver production of Canada was to include, except for Ontario, the quantities of silver produced from Canadian ores either in Canadian or foreign smelters. For Ontario, the sales of silver bullion from the mines and smelters were considered as the year's production. In order to bring the practice for Ontario into harmony with that used in computing the silver output for the other provinces, adjustments amounting to 1,222,450 ounces were made for 1922 to take account of the stocks of silver bullion on hand at the end of 1921 which had not been previously included in the reports on the mineral production of Canada.

Table 90.—Production of Silver in Canada, by Provinces and by Sources, 1928 and 1929

	1928		1929	
	Quantity	Value	Quantity	Value
	Fine ounces	\$	Fine ounces	\$
NOVA SCOTIA—				
In gold bullion.....	77	45	132	70
QUEBEC—				
In gold ores, in blister copper and in copper ores and in silver-lead-zinc ores exported.....	908,959	528,796	813,821	431,269
ONTARIO—				
In silver bullion and nuggets.....	5,954,880	3,464,311	7,345,561	3,892,633
In gold bullion.....	242,468	141,058	256,786	136,079
In slags exported from gold mines.....	5,769	3,350	99	52
In matte, blister copper and in ores, concentrates and residues exported.....	1,039,494	604,737	1,288,280	682,698
Total.....	7,242,601	4,213,456	8,890,726	4,711,462
MANITOBA—				
In gold bullion.....	1,763	1,026	2,644	1,401
ALBERTA—				
In gold bullion.....	7	4		
BRITISH COLUMBIA—				
In alluvial gold.....	1,516	882	1,160	615
In gold bullion.....	1,536	894	1,363	722
In blister copper.....	770,557	448,279	667,052	353,491
In base bullion and in ores exported.....	10,169,758	5,916,358	9,486,833	5,027,357
Total.....	10,943,367	6,366,413	10,156,408	5,382,185
YUKON—				
In alluvial gold.....	7,676	4,466	8,028	4,254
In ores exported.....	2,831,957	1,647,519	3,271,502	1,733,667
Total.....	2,839,633	1,651,985	3,279,530	1,737,921
Canada.....	21,936,407	12,761,725	23,143,261	12,264,308

Table 91.—Production of Silver in Canada, 1887-1929

Year	Fine ounces	Value	Cents per ounce	Year	Fine ounces	Value	Cents per ounce
		\$				\$	
1887.....	355,083	347,271	98-00	1909.....	27,529,473	14,178,504	51-50
1888.....	437,232	410,998	94-00	1910.....	32,869,264	17,580,455	53-49
1889.....	383,318	358,785	93-60	1911.....	32,559,044	17,355,272	53-30
1890.....	400,687	419,118	104-60	1912.....	31,955,560	19,440,165	60-83
1891.....	414,523	409,549	98-00	1913.....	31,845,803	19,040,924	59-79
1892.....	310,651	272,130	86-00	1914.....	28,449,821	15,593,631	54-81
1893.....	428,738	330,128	77-00	1915.....	26,625,960	13,228,842	49-68
1894.....	847,697	534,049	63-00	1916.....	25,459,741	16,717,121	65-66
1895.....	1,578,275	1,030,299	65-28	1917.....	22,221,274	18,091,895	81-417
1896.....	3,205,343	2,149,503	67-06	1918.....	21,383,979	20,693,704	96-772
1897.....	5,558,446	3,323,395	59-79	1919.....	16,020,657	17,802,474	111-122
1898.....	4,452,333	2,593,929	58-26	1920.....	13,330,357	13,450,330	100-900
1899.....	3,411,644	2,032,658	59-58	1921.....	13,543,198	8,485,355	62-654
1900.....	4,468,225	2,740,362	61-33	1922.....	18,626,439	12,576,758	67-521
1901.....	5,539,192	3,265,354	58-95	1923.....	18,601,744	12,067,509	64-873
1902.....	4,291,317	2,238,351	52-16	1924.....	19,736,323	13,180,113	66-781
1903.....	3,198,581	1,709,642	53-45	1925.....	20,228,988	13,971,150	69-065
1904.....	3,577,526	2,047,095	57-22	1926.....	22,371,924	13,894,531	62-107
1905.....	6,000,023	3,621,133	60-35	1927.....	22,736,698	12,816,677	56-370
1906.....	8,473,379	5,659,455	66-79	1928.....	21,936,407	12,761,725	58-176
1907.....	12,779,799	8,348,659	65-33	1929.....	23,143,261	12,264,308	52-993
1908.....	22,106,233	11,686,239	52-86	Total.....	583,394,160	370,719,545	

Table 92.—Production of Silver from Canadian Ores,* by Provinces, 1920-1929

(For the years 1887 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		British Columbia		Yukon Territory	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$		\$
1920.....	61,003	61,552	9,907,626	9,996,795	3,327,028	3,356,971	19,190	19,363
1921.....	38,084	23,861	9,761,607	6,116,037	3,350,357	2,099,133	393,092	246,288
1922.....			10,811,903	7,300,305	7,150,937	4,828,384	663,493	447,997
1923.....	33,006	21,412	10,540,943	6,838,226	6,113,327	3,965,899	1,914,438	1,241,953
1924.....	83,814	55,972	11,272,567	7,527,933	8,153,003	5,444,657	226,755	151,429
1925.....	214,943	148,451	10,529,131	7,271,944	8,579,458	5,925,403	904,893	624,964
1926.....	375,986	233,513	9,274,965	5,760,402	10,625,816	6,599,376	2,095,027	1,301,159
1927.....	740,864	417,625	9,307,953	5,246,893	11,040,445	6,223,499	1,647,295	928,580
1928.....	908,959	528,796	7,242,601	4,213,456	10,943,367	6,366,413	2,839,633	1,651,985
1929.....	813,821	431,268	8,890,726	4,711,462	10,156,408	5,382,185	3,279,530	1,737,922

* Does not include small productions from Nova Scotia, New Brunswick, Alberta and Manitoba.

ONTARIO

Table 93.—Silver in Mine Shipments from Cobalt District and Nearby Camps in Ontario, 1904-1929

(From 1929 Report of Ontario Department of Mines.)

Year	Silver shipments in Troy ounces				
	Cobalt area	Casey township	South Lorrain	Gowganda	Montreal River and Maple Mountain
1904.....	206,875				
1905.....	2,451,356				
1906.....	5,401,766				
1907.....	10,023,311				
1908.....	375,986	500	13,124		
1909.....	19,424,251	26,185	194,955		18,002
1910.....	25,658,683	92,544	221,133	471,688	9,835
1911.....	29,849,981				
1912.....	29,989,893	114,789	933,912	468,687	510
1913.....	28,605,940	253,824	834,119	549,976	
1914.....	28,105,505	825,108	248,992	502,370	
1915.....	24,155,699	499,643	108,199	399,300	
1916.....	24,280,366	223,939		242,229	
1917.....	19,008,517	445,900	77,280	383,393	
1918.....	18,327,258		10,000	1,064,635	
1919.....	16,807,407	143,901	72,188	638,198	
1920.....	10,314,689	171,278	4,586	723,764	
1921.....	10,402,249		8,253	433,352	2,467*
1922.....	7,673,535	1,101	328,886	258,292	117
1923.....	9,239,147	1,028	1,284,307	170,651	15,994†
1924.....	7,259,858		2,955,646	160,761	1,581
1925.....	6,704,787		2,633,058	598,057	
1926.....	6,252,115		3,099,964	1,355,156	
1927.....	6,262,249		3,044,584	1,236,640	
1928.....	4,482,543		2,319,356	1,741,614	
1929.....	3,934,020		1,133,952	1,677,429	
1929.....	4,823,529		876,006	2,081,894	
Total.....	359,645,529	2,799,740	20,402,500	15,158,086	48,506

* Includes 885 oz. from Silver Islet, Lake Superior.

† Silver Islet, exclusively.

MANITOBA

Silver production in Manitoba during the year amounted to 1,763 ounces recovered from crude gold shipped to the Royal Mint at Ottawa. Copper deposits were developed during the war, and from 1918 to 1920 shipments of copper ore containing silver were sent to Trail; in those three years, production from this source amounted to about 50,000 ounces. Owing to the drop in price of copper and to the high freight rates, practically no shipments of copper ores

have been made in recent years. Recent developments in this province indicate that a resumption of production may be looked for at an early date. Copper-gold and copper-zinc properties are being developed; the ores from these deposits are both argentiferous and auriferous indicating a future increase in the precious metal production for this province.

Table 94.—Production of Silver in Manitoba, 1919-1929

Year	Fine ounces	Value
		\$
1919.....	20,700	23,069
1920.....	15,510	15,649
1921.....	33	20
1922.....	20	14
1923.....	5	3
1924.....	140	93
1925.....	477	329
1926.....	18	11
1927.....	12	7
1928.....	1,763	1,026
1929.....	2,644	1,401

Table 95.—Production of Silver in British Columbia by Districts, 1928 and 1929

(From *Annual Report of the Minister of Mines for British Columbia.*)

District and division	1928		1929	
	Ounces	Value	Ounces	Value
		\$		\$
Northwestern District (No. 1)—				
Atlin.....	133	78		
Stikine.....				
Jiard.....				
Nass River.....	273,068	158,860	285,394	151,239
Portland Canal.....	2,369,176	1,378,292	2,373,972	1,258,039
Skeena.....	1,166	678	328	174
Queen Charlotte.....				
Bella Coola.....				
Northeastern District (No. 2)—				
Cariboo.....				
Quesnel.....				
Omineca.....	343,653	169,924	261,351	138,498
Peace River.....				
Central District (No. 3)				
Nicola.....	1,595	928	41,945	22,228
Vernon.....				
Yale.....			1,038	550
Ashcroft.....				
Kamloops.....	320	186	356	189
Lillooet.....	1,400	814	670	355
Clinton.....				
Southern District (No. 4)—				
Grand Forks.....	1,059	616		
Greenwood.....	386,957	225,116	444,429	235,516
Osoyoos.....	3,148	1,831	226	120
Similkameen.....	150,757	87,705	167,040	88,520
Eastern District (No. 5)				
Fort Steele.....	5,595,5*5	3,255,276	5,055,996	2,679,324
Windermere.....	19,023	11,067	2,663	1,411
Golden.....			1,466	777
Ainsworth.....	102,654	59,720	92,323	48,925
Slocan.....	1,117,993	650,404	958,294	507,829
Slocan City.....	13,906	8,090	3,252	1,723
Nelson.....	43,357	25,223	26,868	14,238
Arrow Lake.....				
Trail Creek.....	7,435	4,325	393	208
Revelstoke.....	1,808	1,052	466	247
Trout Lake.....	633	368		
Lardeau.....	5	8	529	280
Western District (No. 6)—				
Nanaimo.....	128	74	216	114
Alberni.....			41	22
Clayoquot.....				
Quatsino.....				
Victoria.....				
New Westminster.....				
Vancouver.....	192,228	111,831	199,544	105,744
Total.....	10,627,167	6,182,461	9,918,800	5,256,270

Table 96.—Imports into Canada and Exports of Silver, 1927-1929

	1927		1928		1929	
	Fine ounces	\$	Fine ounces	\$	Fine ounces	\$
IMPORTS—						
Silver in bars, blocks, ingots, drops, sheets or plates un-manufactured.....		896,535		984,547		958,312
Silver manufactures of, n.o.p.		344,021		350,567		400,125
Silver coin.....		410				
Total.....		1,240,966		1,335,114		1,358,437
EXPORTS—						
Silver contained in ore, concentrates, etc.....	5,445,117	2,894,386	6,815,611	3,824,385	7,058,275	3,736,204
Silver bullion.....	15,970,961	8,995,040	14,805,993	8,579,968	14,879,770	8,022,917
Silver coin.....						83
Total.....	21,416,078	11,889,426	21,621,604	12,404,353	21,938,045	11,759,204

Table 97.—Monthly Average Prices of Silver, 1927-1929

(From the *Engineering and Mining World*)

Month	New York (Cents per fine ounce)			London (Pence per standard ounce)		
	1927	1928	1929	1927	1928	1929
January.....	55-795	57-135	57-019	25-863	26-313	26-257
February.....	57-898	57-016	56-210	26-854	26-205	25-904
March.....	55-306	57-245	56-346	25-655	26-329	26-000
April.....	56-399	57-395	55-668	26-136	26-409	25-738
May.....	56-280	60-298	54-125	26-072	27-654	25-084
June.....	56-769	60-019	52-415	26-203	27-459	24-258
July.....	56-360	59-215	52-510	25-983	27-262	24-288
August.....	54-718	58-880	52-579	25-224	27-095	23-708
September.....	55-445	57-536	51-042	25-565	26-440	23-042
October.....	56-085	58-087	49-913	25-776	26-727	22-690
November.....	57-474	57-953	49-615	26-526	26-704	22-258
December.....	57-957	57-335	48-475	26-701	26-562	
Average.....	56-370	58-176	52-993	26-047	26-747	24-460

World Production.—In order of importance, the chief silver producing countries of the world are: Mexico, the United States, Canada and Peru. This places Canada third in the countries of the world and first in the British Empire.

North America produced 192,024,261 ounces in 1929 out of a total world's production of 261,228,824. South America's output was 28,563,000 ounces; Europe, 11,393,702 ounces, of which 5,465,000 ounces were produced in Germany and 2,500,000 ounces in Spain and Portugal. Oceania was credited with 10,500,000 ounces and the continent of Asia with 14,694,600 ounces while Africa, the greatest gold producing continent of the world, produced only 1,253,261 ounces of silver.

Table 98.—Comparative Figures of Silver Production, for the World, Mexico, United States, Peru and Canada, 1898-1929

Year	World's Output*	Mexico's Output*	United States Output*	Peru's Output*	Canada's Output
	Fine ounces	Fine ounces	Fine ounces	Fine ounces	Fine ounces
1898.....	165,295,572	56,738,000	54,438,000	1,951,240	4,452,333
1899.....	168,337,453	55,612,090	54,764,500	6,525,245	3,411,644
1900.....	173,591,364	57,437,808	57,647,000	7,295,825	4,468,225
1901.....	174,998,573	57,656,549	55,214,000	5,600,848	5,539,192
1902.....	162,763,483	60,176,604	55,500,000	4,264,528	4,291,317
1903.....	167,937,894	70,499,942	54,300,000	1,746,674	3,198,581
1904.....	168,390,238	60,808,978	57,682,800	3,008,705	3,577,526
1905.....	172,317,688	65,040,865	56,101,600	6,156,044	6,000,023
1906.....	165,054,497	55,225,268	56,517,900	7,404,238	8,473,379
1907.....	184,206,984	61,147,203	56,514,700	9,566,118	12,779,799
1908.....	203,236,861	73,664,027	52,440,800	9,566,118	22,106,233
1909.....	211,215,633	73,942,432	54,721,500	9,566,118	27,529,473
1910.....	221,715,673	71,372,194	57,137,900	6,626,930	32,869,264
1911.....	226,192,923	79,032,440	60,399,400	8,351,563	32,559,044

Table 98.—Comparative Figures of Silver Production for the World, Mexico, United States, Peru and Canada, 1898-1929—Concluded

Year	World's Output*	Mexico's Output*	United States Output*	Peru's Output*	Canada's Output
1912.....	224,310,654	74,640,300	63,766,800	8,351,563	31,955,560
1913.....	223,907,843	70,703,828	66,801,500	8,351,563	31,845,803
1914.....	160,669,129	27,546,752	72,455,100	9,214,190	28,449,821
1915.....	177,978,435	39,570,151	74,961,075	9,419,950	26,625,960
1916.....	156,626,521	22,838,385	74,414,802	9,419,950	25,459,741
1917.....	174,187,800	35,000,000	71,740,400	10,864,400	22,221,274
1918.....	198,168,408	62,517,000	67,810,100	9,781,734	21,383,979
1919.....	176,459,609	65,904,224	56,682,445	9,821,729	16,020,657
1920.....	174,212,686	66,662,253	55,361,573	9,196,282	13,330,357
1921.....	171,285,542	64,465,347	53,052,441	10,008,553	13,543,198
1922.....	209,815,448	81,076,899	56,212,054	13,169,765	18,626,439
1923.....	246,009,534	90,859,083	73,295,810	18,654,793	18,601,744
1924.....	239,484,703	91,486,136	65,366,840	18,717,087	19,736,323
1925.....	245,213,993	92,885,465	66,106,922	19,917,439	20,228,988
1926.....	253,795,166	98,291,166	62,672,953	21,499,798	22,371,924
1927.....	251,096,555	104,573,919	60,394,199	18,295,408	22,736,698
1928.....	257,925,154	108,537,307	58,426,004	21,607,693	21,936,407
1929.....	261,715,021	108,700,372	61,233,321	21,495,169	23,143,261

*From Annual report of the "Director of the Mint", Washington.

LEAD

CANADA

Canada's lead production includes (a) lead contained in ores exported less deductions for smelter losses valued at the average price in London for the year; (b) the lead contained in the base bullion made by the Consolidated Mining and Smelting Co., Ltd., valued at the average price in London for the year, and (c) the pig lead made by the Kingdon Mining, Smelting and Manufacturing Co. at Galetta, Ontario, at its sales value.

Production in 1929 included lead from the Sullivan mine in East Kootenay, B.C., and from many smaller mines in the Slocan District; from the Mayo district of the Yukon Territory; from the Galetta mine in Ontario as well as from some lead concentrates shipped from the Chelmsford District of Ontario; and from the Tetreault mine of Notre Dame des Anges, Portneuf county, Quebec.

Previous to 1904, lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces to a base bullion which was then exported for refining. A lead refinery employing the Betts electrolytic process has been in operation at Trail, B.C., since 1904 treating the product from lead blast furnaces.

A decrease in 1929 of 11,424,122 pounds from the Canadian lead production of the previous year was more than compensated for by an increase in valuation of \$991,017, due to higher lead prices. Important quantities of lead are consumed in the storage battery, cable, and pigment industries. Keen competition in the latter field has been displayed recently owing to the introduction of other metals as paint and enamel ingredients. New uses of lead include the making of ethyl gasoline and the lead cushioning of sky scraper foundations.

Table 99.—Production of Lead in Canada, 1928 and 1929

Province	1928		1929	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	6,218,336	284,520	5,358,304	270,616
Ontario.....	6,814,757	402,289	4,769,506	294,431
British Columbia.....	317,722,146	14,537,377	307,999,153	15,555,189
Yukon.....	7,191,449	329,045	8,395,603	424,012
Total.....	337,946,68	15,553,231	326,522,566	16,544,248

Table 100.—Production* of Lead from Canadian Ores, 1887-1929

Year	Pounds	Value	Year	Pounds	Value
		\$			\$
1887.....	204,800	9,216	1909.....	45,857,424	1,692,139
1888.....	674,500	29,812	1910.....	32,987,508	1,216,249
1889.....	165,100	6,488	1911.....	23,784,969	827,717
1890.....	105,000	4,704	1912.....	35,763,476	1,597,554
1891.....	88,665	3,857	1913.....	37,662,703	1,754,705
1892.....	808,420	33,064	1914.....	36,337,765	1,627,568
1893.....	2,135,023	79,636	1915.....	46,316,450	2,593,721
1894.....	5,703,222	187,636	1916.....	41,497,615	3,532,692
1895.....	16,461,794	531,716	1917.....	32,576,281	3,628,020
1896.....	24,199,977	721,159	1918.....	51,398,002	4,754,315
1897.....	39,018,219	1,396,853	1919.....	43,827,699	3,053,037
1898.....	31,915,319	1,206,399	1920.....	35,953,717	3,214,262
1899.....	21,862,436	977,250	1921.....	66,679,592	3,828,742
1900.....	63,169,821	2,760,521	1922.....	93,307,171	5,817,702
1901.....	51,900,958	2,249,387	1923.....	111,234,466	7,985,522
1902.....	22,956,381	934,095	1924.....	175,485,499	14,221,345
1903.....	18,139,283	768,562	1925.....	253,590,578	23,127,460
1904.....	37,531,244	1,617,221	1926.....	283,801,265	19,240,661
1905.....	56,864,915	2,676,632	1927.....	311,423,161	16,477,139
1906.....	54,608,217	3,089,187	1928.....	337,946,688	15,553,231
1907.....	47,738,703	2,542,086	1929.....	326,522,566	16,544,248
1908.....	43,195,733	1,814,221	Total.....	2,963,402,325	175,927,731

*Previous to 1913 the figures reported show the metal content of the shipments and are somewhat in excess of the actual amount recovered. Since 1912 the data given represent the quantity of lead produced in Canada from domestic ores, together with the estimated lead recovery from lead ores and concentrates exported.

Table 101.—Production of Lead from Canadian Ores, by Provinces, 1920-1929

(For years 1887 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		British Columbia		Yukon	
	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$	Pounds	Value \$
1920.....	905,472	80,949	2,255,520	201,643	32,792,725	2,931,670	.....	.....
1921.....	595,881	34,215	3,312,493	190,203	60,298,603	3,462,346	2,472,615	141,978
1922.....	.....	.....	2,890,397	180,216	87,093,266	5,430,265	3,323,508	207,221
1923.....	520,041	37,334	4,401,494	315,983	99,541,818	7,146,107	6,771,113	486,098
1924.....	1,058,983	85,820	5,055,368	409,687	168,467,628	13,652,617	903,520	73,221
1925.....	2,051,100	187,060	7,209,534	657,510	242,454,502	22,111,850	1,875,442	171,040
1926.....	3,729,636	251,788	7,398,795	580,730	266,812,461	18,012,509	5,860,373	395,634
1927.....	6,496,577	341,461	7,990,709	528,729	292,770,544	15,388,020	4,165,331	218,929
1928.....	6,218,336	281,520	6,814,757	402,289	317,722,146	14,537,377	7,191,449	329,045
1929.....	5,358,304	270,616	4,769,506	294,431	307,999,153	15,555,189	8,395,603	424,012

Table 102.—Refined Lead Produced in Canada,* 1904-1929

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1904.....	7,519,440	1913.....	37,923,043	1922.....	81,412,716
1905.....	15,804,509	1914.....	36,443,706	1923.....	101,096,312
1906.....	20,471,314	1915.....	43,518,618	1924.....	130,471,209
1907.....	26,607,461	1916.....	33,087,474	1925.....	213,217,605
1908.....	36,549,274	1917.....	32,115,114	1926.....	257,273,585
1909.....	41,883,614	1918.....	31,571,112	1927.....	295,766,327
1910.....	32,987,508	1919.....	34,330,920	1928.....	301,067,819
1911.....	23,525,050	1920.....	28,720,030	1929.....	304,449,673
1912.....	35,893,190	1921.....	60,949,793	Total.....	2,264,656,415

* Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galletta, Ont.

Table 103.—Imports into Canada and Exports of Lead, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	\$	Pounds	\$	Pounds	\$
IMPORTS—						
Old and scrap, pig and block.....	405,127	33,165	531,404	31,141	1,173,481	68,787
Bars and sheets.....	112,039	8,903	161,970	10,742	260,862	16,437
Litharge.....	3,015,000	245,630	3,977,300	279,136	5,592,200	423,261
Acetate and nitrate of lead.....	337,044	28,218	261,768	21,382	415,596	32,452
Other manufactures.....	—	344,053	—	342,349	—	293,629
Pipe lead.....	109,293	8,456	184,754	13,648	62,874	5,138
Shots and bullets.....	14,129	1,511	11,158	1,408	13,434	1,474
Tea lead.....	59,808	5,936	34,650	3,022	13,480	1,350
Lead pigments—						
Dry white lead.....	338,399	24,879	289,001	21,761	67,585	6,297
White lead, ground in oil.....	360,301	28,252	492,497	39,211	236,093	19,538
Dry red lead and orange mineral.....	1,844,288	125,358	1,469,943	100,733	1,791,872	134,685
Total.....	—	854,367	—	864,533	—	1,003,048
EXPORTS—						
Lead in ore.....	13,032,600	844,637	14,962,900	893,709	15,976,800	1,047,441
Pig lead.....	239,409,100	11,981,388	255,421,700	10,172,075	228,374,100	10,053,402
Total.....	252,441,700	12,826,025	270,384,600	11,065,784	244,350,900	11,100,843

Table 104.—Monthly Average Prices of Pig Lead, Montreal,* New York and London,† 1927-1929

Month	Montreal (Value in cents per pound)			New York (Value in cents per pound)			London† (Value in pounds sterling per long ton)		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
January.....	7.52	6.40	6.43	7.577	6.500	6.650	27.485	21.773	22.111
February.....	7.48	6.11	6.58	7.420	6.329	6.853	27.344	20.283	23.128
March.....	7.62	5.96	7.17	7.577	6.000	7.450	27.845	19.938	25.409
April.....	7.22	5.90	7.08	7.126	6.100	7.187	26.546	20.306	24.783
May.....	6.82	5.84	6.74	6.616	6.123	7.000	25.054	20.483	23.949
June.....	6.65	5.91	6.70	6.414	6.300	7.000	24.438	20.985	23.694
July.....	6.45	5.83	6.55	6.344	6.220	6.804	23.491	20.602	22.810
August.....	6.40	5.98	6.60	6.681	6.248	6.750	23.119	21.634	23.185
September.....	6.07	6.11	6.67	6.297	6.450	6.890	21.446	22.050	23.557
October.....	5.87	6.14	6.62	6.250	6.500	6.873	20.479	22.082	23.226
November.....	6.06	6.21	6.48	6.259	6.389	6.285	20.889	21.239	21.622
December.....	6.43	6.27	6.50	6.504	6.495	6.250	22.163	21.342	21.472
Average.....	6.73	6.06	6.67	6.755	6.305	6.833	24.192	21.060	23.246

*Producers' prices for car load quantities ex-cars Montreal, as furnished by the Consolidated Mining and Smelting Company.

†From the *Engineering and Mining World*.

‡Computed at par (\$4.8666), the London price of lead in 1927—5.256 cents per pound; in 1928—4.575 cents per pound; and in 1929—5.050 cents per pound.

Table 105.—World Production of Lead, 1925-1929

(From the *Year Book of the American Bureau of Metal Statistics* 1929).

(Short tons)

Country	1925	1926	1927	1928	1929
United States.....	662,500	696,000	673,000	649,800	688,000
Canada (a).....	126,795	141,900	155,711	168,973	163,261
Mexico.....	205,159	220,879	274,025	260,675	274,232
Total North America.....	994,454	1,058,779	1,102,736	1,079,448	1,125,493
Argentina.....	8,488	9,370	8,598	9,305	10,408
Peru (b).....	(c)	(c)	3,601	16,070	21,595
Other South America (b).....	4,700	10,100	2,500	1,000	2,500
Total South America.....	13,188	19,470	14,699	26,375	34,503

Table 105.—World Production of Lead, 1925-1929—Continued

(From the *Year Book of the American Bureau of Metal Statistics*, 1929).

(Short tons)

Country	1925	1926	1927	1928	1929
Austria.....	5,961	7,141	8,913	8,967	7,241
Belgium.....	72,278	68,080	72,906	68,982	68,577
Czechoslovakia.....	2,426	2,537	2,677	3,231	3,307
France.....	22,641	21,495	27,528	25,255	22,597
Germany.....	77,712	84,436	92,593	95,900	107,915
Great Britain.....	5,303	4,777	6,759	9,522	11,948
Poland.....	30,146	30,648	31,839	40,094	39,451
Greece.....	5,914	5,622	5,291	7,937	9,370
Italy.....	26,979	26,003	26,206	23,435	24,984
Jugoslavia.....	12,070	10,812	11,764	11,314	9,921
Russia.....	1,067	1,479	1,341	3,307	8,818
Spain.....	152,338	162,470	153,278	135,652	146,894
Sweden.....	901	621	457	18	.....
Total Europe.....	415,736	426,121	441,552	433,614	461,023
Turkey.....	5,276	6,629	8,655	7,674	7,164
India (Burma).....	52,945	60,849	73,883	87,790	89,860
Japan.....	3,678	3,978	3,741	4,027	3,748
Total Asia.....	61,899	71,456	86,279	99,491	100,772
Australia.....	165,634	170,412	184,710	174,857	194,746
Rhodesia.....	3,674	4,292	6,561	5,230	1,831
Tunis.....	15,070	20,262	20,571	19,672	20,832
Total Africa.....	18,744	24,554	27,132	24,902	22,663
Grand Totals.....	1,669,655	1,770,792	1,857,108	1,833,687	1,939,200

(a) Dominion Bureau of Statistics final figures.

(b) Does not include lead produced from South American ore exported to European countries, principally Belgium and Germany.

(c) Included in "Other South America."

(d) The statistics of lead production in Polish Silesia have been changed so that they are now given in terms of base bullion, which conforms to the practice in respect of most of the other countries. This change has been made retrospectively beginning 1922.

ZINC

Refined zinc is produced at Trail, B.C., from the silver-lead-zinc ores of the West Kootenay district and from the Sullivan mine at Kimberley, B.C. Zinc concentrates are exported to Belgium, and France from the Tetreault silver-lead-zinc property in Quebec. The Treadwell Yukon Mining Co., Ltd. made shipments of zinc concentrates from its property in the Sudbury district, near Chelmsford, Ontario.

Figures for the Canadian total production of zinc are made up by adding the production of refined zinc at Trail to the amount of zinc estimated as recoverable from ores exported; the value of production is calculated at the monthly average price for zinc on the London market for the year, exchange conversion being made at par. Previous to 1926, the average price on the St. Louis market was used, but as the bulk of Canada's zinc output is exported and sold on the basis of London quotations, it was thought that a more accurate aggregate value would be obtained by using prices quoted in London, and in 1926 this change in practice was made. It may be noted that the present procedure is in conformity with the practice of the British Columbia Department of Mines.

Zinc production in Canada for 1929 showed an increase of 6.8 per cent over that of the previous year. Active and extensive development of sulphide deposits containing both massive and disseminated copper-zinc ore occurred in the provinces of Manitoba, Ontario and Quebec, portending an increased Canadian zinc output in the near future. In Nova Scotia the British Metals Corporation Ltd., continued operations at the Sterling lead-zinc mine. Recent research has led to the utilization of large quantities of zinc in die casting, especially in the motor and hardware industries.

Table 106.—Production of Zinc in Canada, 1928 and 1929

Province	1928		1929	
	Pounds	Value	Pounds	Value
		\$		\$
Quebec.....	21,057,760	1,156,745	19,653,440	1,058,731
Ontario.....	58,724	3,226	5,516,806	297,190
British Columbia.....	163,530,890	8,983,079	172,096,841	9,270,857
Total.....	184,647,374	10,143,050	197,267,087	10,626,778

Table 107.—Production of Zinc from Canadian Ores, 1920-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quantity	Value	Year	Quantity	Value
		\$			
1920.....	39,863,912	3,057,961	1925.....	109,268,511	8,328,446
1921.....	53,089,356	2,471,310	1926.....	149,938,105	11,110,413
1922.....	56,290,000	3,217,536	1927.....	165,495,525	10,250,793
1923.....	60,416,240	3,991,701	1928.....	184,647,374	10,143,050
1924.....	98,909,077	6,274,791	1929.....	197,267,087	10,626,778

Table 108.—Production of Zinc from Canadian Ores, by Provinces, 1920-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		Alberta		British Columbia	
	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$	Quantity	Value \$
1920.....	1,120,200	85,931	13,950	1,070			38,729,762	2,970,960
1921.....							53,089,356	2,471,310
1922.....							56,290,000	3,217,536
1923.....	366,240	24,197					60,050,000	3,967,504
1924.....	2,909,008	184,547					96,000,069	6,090,244
1925.....	9,936,000	757,322	179,545	13,685			99,152,966	7,557,439
1926.....	12,904,176	956,199					137,033,929	10,154,214
1927.....	17,189,046	1,064,690					148,306,479	9,186,103
1928.....	21,057,760	1,156,745	58,724	3,226			163,530,893	8,983,079
1929.....	19,653,440	1,058,731	5,516,806	297,190			172,096,841	9,270,857

Table 109.—Production of Refined Zinc at Trail, B.C., 1916-1929

Year	Short tons	Year	Short tons
1916.....	2,974	1923.....	30,025
1917.....	9,985	1924.....	27,444
1918.....	12,574	1925.....	38,462
1919.....	12,326		
1920.....	18,517	1926.....	61,727
		1927.....	73,208
1921.....	26,494	1928.....	81,765
1922.....	28,145	1929.....	86,048

Table 110.—Imports into Canada and Exports of Zinc and Brass, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
IMPORTS		\$		\$		\$
Zinc and Zinc Products—						
Zinc, in blocks, pigs and sheets.....	5,911,727	512,389	9,299,015	687,293	10,631,343	787,432
Zinc, as spelter.....	1,355,816	89,233	1,845,258	107,920	2,658,483	165,566
Zinc white (80% Zn.).....	16,665,713	1,113,573	18,128,757	1,166,491	19,052,472	1,248,668
Zinc dust.....	339,055	34,110	458,923	44,906	483,192	38,891
Zinc, sulphate and chloride of (44% Zn.).....	2,032,015	86,149	2,530,141	98,501	3,123,840	125,742
Zinc, manufactures of.....		277,236		169,071		167,795
Lithopone.....	15,804,451	644,175	16,287,182	717,207	19,408,436	852,079
Total.....		2,756,865		2,991,389		3,386,173
Brass and Brass Products—						
Brass, in blocks, pigs and ingots (30% Zn.).....	819,500	99,956	1,175,200	153,488	1,008,500	165,444
Brass, old and scrap (30% Zn.).....	2,908,500	270,627	3,395,700	356,000	4,780,200	617,492
Brass, tubing (30% Zn.).....	2,765,078	627,124	3,322,210	748,869	4,074,669	1,020,931
Brass, plain wire (30% Zn.).....	453,239	113,668	393,204	98,658	471,797	138,000
Brass, strips, sheets or plates.....	652,300	114,270	773,200	142,150	1,021,700	202,910
Brass, wire cloth, n.o.p.....	784,700	158,742	1,416,500	264,551	1,105,300	265,925
Brass, cup for manufacture of shells.....		48,030		53,463		63,895
Brass, caps for electric batteries.....		96,773		157,274		173,609
Brass, hand-pumps.....		16,373		11,710		11,137
Brass, nails, tacks, etc.....		25,479		28,511		31,287
Brass and copper rivets, burrs and washers.....		3,057		5,214		8,645
Brass valves.....		85,576		87,659		227,652
Brass, other manufactures, n.o.p.....		307,753		401,824		571,551
Carburetors of brass.....		3,089,060		3,660,436		4,004,585
Tubing, brass or copper, not more than ½-inch in diameter, in lengths not less than 6 feet, coated with metal, and not polished, bent or otherwise manufactured.....		39,444		35,015		43,790
Total.....	5,335	1,173	2,043	383	49	14
EXPORTS						
Zinc—In Ore.....			22,510,000	1,438,619	25,738,900	1,415,725
Ore.....	50,454,000	862,498				
Spelter.....	112,420,400	6,826,808	127,188,500	6,602,867	135,085,700	7,031,645
Scrap, dross and ashes.....	5,877,100	178,572	6,914,000	203,884	7,638,200	262,719
Total.....		7,867,868		8,245,370		8,710,089
Brass—						
Old and scrap.....	7,296,400	584,725	11,548,200	984,071	11,918,500	1,206,510
Rods, sheets and tubing.....	47,300	10,054	49,600	9,385	66,900	15,910
Valves.....		248,385		261,419		282,429
Mfrs. of brass, n.o.p.....		505,848		594,159		892,850
Total.....		1,349,012		1,819,034		2,397,699

Table 111.—Monthly Average Prices of Zinc at Montreal, St. Louis and London, 1927-1929

Month	Montreal ¹ (In cents per pound)			St. Louis ² (In cents per pound)			London ² (In pounds Sterling per long ton)		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
January.....	8-18	7-10	7-29	6-661	5-613	6-350	30-979	26-125	26-196
February.....	8-17	7-00	7-30	6-673	5-551	6-350	29-931	25-618	26-247
March.....	8-16	7-08	7-37	6-692	5-624	6-463	30-649	25-082	27-050
April.....	7-80	7-21	7-23	6-338	5-759	6-658	29-579	25-493	26-759
May.....	7-53	7-39	7-05	6-075	6-026	6-618	29-034	26-102	26-727
June.....	7-68	7-35	7-00	6-213	6-158	6-686	28-598	25-664	26-216
July.....	7-66	7-23	6-94	6-229	6-201	6-766	28-280	24-946	25-332
August.....	7-80	7-15	6-85	6-342	6-249	6-800	28-210	24-540	24-896
September.....	7-67	6-97	6-74	6-212	6-250	6-799	27-347	24-497	24-208
October.....	7-46	6-91	6-50	5-996	6-250	6-740	26-899	24-030	22-927
November.....	7-20	6-99	6-15	5-745	6-263	6-242	26-281	24-801	20-851
December.....	7-18	7-30	6-00	5-722	6-349	5-666	26-363	26-609	20-103
Average.....	7-71	7-14	6-87	6-242	6-027	6-512	28-513	25-284	24-793

¹Supplied by Consolidated Mining and Smelting Co., Montreal, P.Q.²From the *Engineering and Mining World*.

Converted at par, the average London quotations in cents per pound: in 1927 were 6-194 cents, in 1928 were 5-493 cents, and in 1929 were 5-387 cents per pound.

Table 112.—World Production of Zinc, (a) 1925-1929

(From the Year Book of the American Bureau of Metal Statistics)

(Short tons)

Country	1925	1926	1927	1928	1929
United States.....	590,928	638,533	613,548	617,613	638,849
Mexico.....	1,406	6,550	7,089	12,368	16,643
Canada (c).....	54,634	74,969	82,748	92,324	98,634
Belgium.....	188,339	208,078	219,457	227,404	220,316
Czechoslovakia.....	3,307	3,074	5,421	9,103	13,691
France.....	74,693	80,969	92,161	106,783	100,984
Germany.....	64,620	75,361	92,706	108,136	112,185
Great Britain.....	42,726	20,148	46,893	62,043	65,294
Italy.....	7,141	8,417	8,121	11,744	17,206
Jugoslavia.....	2,460	2,619	3,511	4,762	8,061
Netherlands.....	23,277	27,333	28,955	29,635	28,342
Norway.....	7,503	5,907	6,049	.....	5,069
Poland (b).....	126,038	136,393	165,755	178,269	186,324
Russia.....	1,653	2,059	2,498	4,740	4,853
Spain.....	16,669	17,707	18,222	14,935	13,030
Sweden.....	5,233	5,291	5,160	5,629	5,201
Australia.....	51,280	52,942	54,438	55,010	56,001
Japan.....	18,684	18,708	19,288	21,086	25,353
French Indo-China.....	1,276	1,396	1,291	3,182	4,196
Rhodesia.....	.....	.....	.....	10,730	13,575
Totals.....	1,281,867	1,386,454	1,473,311	1,575,496	1,633,807

(a) Slab zinc produced in the several countries, unallocated according to the origin of the ore.

(b) Under the head of Poland has been included the production of Upper Silesia and Galicia, when those provinces belonged to Germany and Austria, respectively.

(c) Dominion Bureau of Statistics final figures.

CHAPTER FOUR

THE NICKEL-COPPER INDUSTRY IN CANADA

Including Commodity Statistics Tables on Nickel, Copper, and Metals of the Platinum Group

1. General Review.
2. Commodity statistics including tables showing production by provinces, imports, exports, prices and world output of nickel, copper and metals of the platinum group.

1. General Review

(a) *Definition of the Industry.*—The nickel-copper industry in Canada includes the mining, smelting, and to a certain extent, the refining of the nickel-copper ores of the Sudbury district in the province of Ontario. Smelting operations are carried on in close proximity to the mines, and refining is done at Port Colborne in Ontario, while some of the matte is exported for treatment in plants at Clydach, Wales and Huntingdon, Va.

As thus defined, the industry in Canada constitutes the source of nickel, most of the production of the platinum group metals, and one of the principal sources of copper.

Another industry, the copper-gold-silver mining group also produces a large part of the Dominion output of copper, but as the ores of this group, in the aggregate, contain about 5 per cent of the gold produced each year from Canadian mines, the activities of the copper-gold mines are reviewed in the chapter on the gold mining industry. Production and trade statistics on nickel, copper and the metals of the platinum group are given in this chapter.

(b) *Historical.*—Construction of railways in Canada has lead, in several instances, to the discovery of valuable mineral deposits as for example, the finding of the nickel-copper ore bodies in the Sudbury area when the Canadian Pacific Railway was being built in 1883. The first of these was worked in 1886 primarily for copper, the presence of nickel not being detected until 1887. About this time the use of nickel in the manufacture of nickel steel was introduced and the resulting demand for nickel made possible the successful development of the great industry that has now become so firmly established. Nickel steel was made in large quantities for armament purposes, and nickel production reached its peak during the great war. After hostilities ceased, the demand for nickel was considerably reduced and the nickel industry was depressed. Since that time, by intensive research, new uses have been found for this metal and production in 1929 far exceeded any previous output.

(c) *Importance of Nickel, Copper and Platinum Group Metals.*—About 90 per cent of the world's supply of nickel is derived from Canadian ores, the remainder being obtained in New Caledonia and Norway. A small amount of nickel is found in the silver-cobalt ores of the Cobalt district, but most of the tonnage is produced from the ores of the Sudbury area.

Copper produced from the nickel-copper ores in Ontario constitutes about 41 per cent of the total copper obtained from all Canadian ores. British Columbia, mining and smelting copper ores and copper-gold ores, produces more than 42 per cent of Canada's copper output. Quebec supplies the remainder.

As a world producer of copper, Canada ranks fourth, contributing about 6 per cent of the world's output annually. The amount of refined copper produced in Canada is relatively small, heretofore it has usually been found more profitable to ship blister copper or copper in matte or in concentrates, to smelters in other countries where the demand for refined copper is greater than in Canada. Improvement in the Canadian demand for the refined metal may be expected as a phase of the industrial expansion now being observed, and the output of refined copper from Canadian plants, should increase proportionately unless other untoward features of the market arise to check this progress.

Some gold and silver as well as metals of the platinum group, including, besides platinum, the related metals, palladium, rhodium, osmium and iridium, are present in varying amounts in the different ores of the Sudbury district. Some of these ores are richer than others in precious metals, and the recovery of platinum group metals, therefore, has been a feature of the work done by the great nickel companies.

At the present time, Canada produces about 5 per cent of the world's supply of platinum, but recovery of much of this metal is carried out in refineries operating outside the confines of the Dominion.

Interest in the development work carried on by the same companies operating nickel-copper properties in the Sudbury area increased during 1929. The International Nickel Company of Canada, Limited, continued to operate the Creighton mine and the smelter at Coppercliff and to produce refined and electrolytic nickel, nickel oxides and salts, and blister or converter copper in the refinery at Port Colborne, Ontario. Development of the Frood mine added greatly to the company's reserves. The same Company, operating the Garson and Levack mines and the smelter at Coniston, Ontario worked steadily throughout the year producing matte for shipment to their refinery at Clydach, Wales, and utilized the bessemer gases for the manufacture of high-grade sulphuric acid for which a splendid market has been established. Low production costs enable the company to make very favourable contracts with large users of acid.

(d) *Mining*.—The ore in the Sudbury district averages from 2 to 4 per cent of nickel and from 1 to 3 per cent of copper, and is usually a mixture of the sulphides of copper, nickel and iron in the form of pyrrhotite, pentlandite and chalcopyrite associated with and genetically related to norite, a basic intrusive rock. Open-pit methods of mining were first used, but later, underground workings were adopted. Shafts are sunk and haulage ways are driven into a solid foot wall, the ore being intersected at intervals by cross cuts. The ore is usually hoisted to rock houses where it is crushed and hand-sorted; the high-grade material is suitable for direct smelting. All ore from the nickel mines cannot be hand-sorted satisfactorily, often the precious and other metal-bearing minerals are finely disseminated through the ore zone, so that crushing and concentration of the product from the mine are necessary before smelting can be undertaken with satisfactory results.

(e) *Smelting and Refining*.—Practice in the preparation of the ore for smelting varies. The International Nickel Company heap-roasts the coarse ore before smelting at Coppercliff, and at Coniston roasts only the fines and flue dust on Dwight-Lloyd sintering machines. Both plants smelt in water-jacketed furnaces, producing a slag which is sent to the dump, and a matte which contains 15 to 25 per cent of copper-nickel in addition to sulphur. This low-grade matte is transferred to a basic converter where practically all of the iron and part of the sulphur are eliminated. The product of these converters, bessemer matte, contains about 80 per cent copper-nickel; 19.5 per cent sulphur; 0.5 per cent iron; this product is shipped to the refineries for further treatment.

The International Nickel Company ships some matte to the Port Colborne refinery, where the products are converter copper, containing some gold and silver; electrolytic nickel; refined nickel and nickel oxide; and residues containing palladium and platinum. This company exports the remainder of the matte produced at the smelter to Huntingdon, West Virginia, U.S.A.; for manufacture into monel metal, an alloy of copper and nickel in which the constituents are present in about the same proportions in which they occur in the ore and are not separated during refining process.

Smelter matte is also shipped to the company's refinery at Clydach, Wales, for reduction. The refinery produces nickel metal of very high purity that finds many uses in the metallurgical field, also copper sulphate, chiefly for use as an insecticide. Much of the nickel from the plant near Clydach, Wales, is shipped to foreign plants for use in the manufacture of nickel alloys.

A considerable market has been built up for these alloys due to their resistance to corrosion. Chemical works, creameries, and other plants of a similar nature, are gradually increasing their uses for nickel and its alloys.

Activity and expansion in the nickel mining industry at Sudbury was especially pronounced in 1929 and included the construction by the International Nickel Company of a 5,000 ton smelter and an 8,000 ton concentrator at Coppercliff.

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Erection of a new electrolytic copper refinery with a monthly capacity of 10,000 tons of refined copper was commenced at Coppercliff. This metallurgical development is shared by the International Nickel Company, Consolidated Mining and Smelting Company, and the American Metal Company of New York.

Progress was rapid in both mine development and surface construction at the property of the Falconbridge Nickel Mines, Ltd., the new 250 ton smelter of this company is expected to operate early in 1930.

The annual report of the International Nickel Company gives proven ore reserves at 202,620,000 short tons, of which those of the famous Frood deposit contribute 134,673,000 tons. Over 10,000,000 tons of high grade ore were added to the reserves of this mine from development completed in the lower levels during 1929.

Table 113.—Capital Employed in the Nickel-Copper Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
Capital employed as represented by—		
Cost of lands, buildings, plant, machinery and tools—		
Mines.....		
Smelters and refinery.....	45,106,028	16,698,121
Cost of materials and supplies on hand.....	20,199,878	34,902,103
Cash, trading and operating accounts and bills receivable.....	5,075,811	7,803,673
	6,223,842	4,129,182
Total.....	76,605,559	63,533,079

Table 114.—Output from Nickel-Copper Mines and Smelters in Canada, 1928 and 1929

	1928	1929
Ore mined..... tons	1,457,910	1,991,910
Ore shipped..... tons	1,457,910	1,991,910
Content of ores, etc., shipped:—		
Copper..... lb.	67,485,937	103,457,449
Nickel..... lb.	100,420,842	128,901,304
Ores and concentrates treated at smelters..... tons	1,476,704	2,033,457
Matte produced..... tons	91,313	132,030
Content of matte:—		
Copper..... lb.	59,408,538	92,630,143
Nickel..... lb.	86,786,830	116,190,232
Matte shipped to Canadian refineries..... tons	66,463	115,599
Matte exported to Foreign smelters..... tons	39,310	25,086

Table 115.—Proportion of Nickel and Copper in Sudbury Matte, 1912-1929

Year	Percentage		
	Nickel	Copper	Total
1912.....	53.5	26.3	79.8
1913.....	52.7	27.4	80.1
1914.....	49.0	31.1	80.1
1915.....	50.3	29.0	79.3
1916.....	51.6	28.0	79.6
1917.....	50.6	26.9	77.5
1918.....	52.6	26.0	78.6
1919.....	51.6	28.3	79.9
1920.....	52.7	27.6	80.3
1921.....	49.4	32.4	81.8
1922.....	50.1	31.3	81.4
1923.....	53.4	27.2	80.6
1924.....	52.6	27.9	80.5
1925.....	52.1	27.9	80.0
1926.....	49.6	30.6	80.2
1927.....	48.4	31.7	80.1
1928.....	47.6	32.6	80.2
1929.....	44.0	35.1	79.1

Table 116.—Employees, Salaries and Wages, in the Nickel-Copper Industry in Canada, 1928 and 1929.

	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
Salaried employees—				\$				\$
Mine and mill.....	43	1	44	142,249	46	1	47	151,655
Smelters and refinery.....	128	15	143	464,560	149	17	166	537,697
Total.....	171	16	187	606,809	195	18	213	689,352
Wage-earners—								
Mine and mill.....	1,919		1,919	2,994,589	3,172		3,172	4,954,220
Smelters and refinery.....	2,006	1	2,007	3,032,121	2,875		2,875	4,473,625
Total.....	3,925	1	3,926	6,056,710	6,047		6,047	9,427,845
Grand total.....	4,096	17	4,113	6,663,519	6,242	18	6,260	10,117,197

Table 117.—Employees by Months in the Nickel-Copper Industry in Canada, 1928 and 1929

Month	Mine		Mill	Smelters	Refinery	Total
	Surface	Under-ground				
1928						
January.....	368	1,079	119	1,188	505	3,259
February.....	366	1,089	119	1,160	609	3,343
March.....	351	1,108	116	1,154	624	3,353
April.....	360	1,137	115	1,134	655	3,401
May.....	371	1,173	116	1,166	715	3,541
June.....	392	1,215	114	1,221	770	3,712
July.....	416	1,291	108	1,239	788	3,842
August.....	450	1,378	117	1,232	924	4,101
September.....	520	1,494	115	1,237	930	4,296
October.....	533	1,575	120	1,250	985	4,463
November.....	514	1,653	115	1,247	1,018	4,547
December.....	494	1,641	128	1,295	1,043	4,601
1929						
January.....	454	1,748	173	1,406	1,079	4,860
February.....	470	1,800	190	1,452	1,123	5,035
March.....	526	1,800	199	1,471	1,134	5,130
April.....	642	1,916	215	1,484	1,187	5,444
May.....	683	1,990	214	1,491	1,281	5,659
June.....	706	2,173	225	1,549	1,393	6,046
July.....	728	2,232	232	1,607	1,466	6,265
August.....	753	2,429	243	1,568	1,473	6,466
September.....	777	2,556	242	1,623	1,392	6,590
October.....	794	2,711	239	1,681	1,419	6,844
November.....	816	3,010	248	1,779	1,380	7,233
December.....	806	2,906	219	1,771	1,301	7,003

NICKEL

Production figures include nickel in matte and speiss exported from the Canadian smelters valued at 18 cents per pound; refined and electrolytic nickel produced in Canada, valued at the average price received for sales of nickel metal from the refinery during the year, and the nickel equivalent in oxides and salts sold, valued in the aggregate at the sum obtained from the sales of oxides and salts.

Table 118.—Production of Nickel from Canadian Ores, 1920-1929

(For years 1889 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Pounds of nickel	Value	Year	Pounds of nickel	Value
		\$			\$
1920.....	61,335,706	24,534,282	1925.....	73,857,114	15,946,672
1921.....	19,293,060	6,752,571	1926.....	65,714,294	14,374,163
1922.....	17,597,123	6,158,993	1927.....	66,798,717	15,262,171
1923.....	62,453,843	18,332,077	1928.....	96,755,578	22,318,907
1924.....	69,536,350	19,470,178	1929.....	110,275,912	27,115,461

Table 119.—Production in Canada, Imports and Exports of Nickel 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	\$	Pounds	\$	Pounds	\$
PRODUCTION—						
Nickel in matte and speiss exported*.....	31,584,097	5,685,138	37,783,991	6,801,118	28,172,633	5,071,074
Refined and electrolytic nickel produced.....	28,469,996	7,497,436	49,144,875	12,596,371	70,704,762	18,639,814
Nickel in oxides and salts sold.....	6,744,624	2,079,597	9,826,712	2,921,418	11,398,517	3,404,573
Total.....	66,798,717	15,262,171	96,755,578	22,318,907	110,275,912	27,115,461
IMPORTS—						
Nickel, nickel silver and German silver, in ingots or blocks, n.o.p.....	1,549,692	547,138	217,112	79,001	31,006	8,492
Nickel in bars and rods, strips, sheets and plates.....	825,715	233,366	730,106	240,378	1,243,865	388,296
Nickel silver and German silver, in bars, rods, strips, sheets, plates or anodes.....	77,940	26,639	168,494	57,191	258,445	94,827
Nickel chromium, in bars and rods.....			50,990	52,738	71,938	72,790
German, Nevada and nickel silver, manufactures of, not plated.....		333,916		382,730		606,236
Nickel-plated household hollow-ware.....		81,562		85,138		94,796
Nickel-plated ware, n.o.p.....		2,113,246		2,451,421		3,224,828
Total nickel and its products.....		3,335,867		3,348,597		4,490,265
EXPORTS—						
Nickel, fine.....	29,015,800	7,896,211	51,188,700	13,320,034	68,408,200	17,544,513
Nickel contained in matte.....	36,458,800	5,784,623	36,370,800	5,457,222	29,630,700	4,501,389
Nickel in oxide.....	5,196,100	1,600,986	9,607,200	3,004,951	11,600,900	3,489,782
Total.....	70,670,700	15,281,820	97,166,700	21,782,207	109,639,800	25,535,684

*Nickel in matte and speiss exported valued at 18 cents per pound.

Table 120.—World Production of Nickel Ore, 1925-1929

(In terms of metal)

(From the Mineral Industry of the British Empire and Foreign Countries)

(Short tons)

Country	1925	1926	1927	1928	1929
British Empire—					
Canada.....	36,929	32,860	33,399	48,378	55,138
India (b).....		(a)	284	814	930
Australia.....			96		95
Foreign countries—					
Italy.....	7				
Greece.....		30	28	726	(a)
Norway.....			179	451	483
United States (c).....	272	306	860	522	343
New Caledonia (d).....	3,718	4,220	3,543	2,063	4,584
World's Total.....	40,926	37,416	33,389	52,954	61,573

(a) Information not available.

(b) Nickel metal in speiss obtained as a by-product in smelting operations.

(c) Nickel content of salts and nickel produced as a by-product in the electrolytic refining of copper.

(d) Nickel content of exports.

COPPER

CANADA

Copper production includes copper contained in ores and concentrates exported, copper in blister copper made, in matte exported and in copper sulphate made during the year.

Refined copper was produced commercially in quantity for the first time in Canada in 1916 at the Trail refinery of the Consolidated Mining and Smelting Company. The British America Nickel Corporation which produced refined copper at the Deschenes refinery for the first time in 1920, went into liquidation during July, 1924.

A new plant for the electrolytic refining of copper is under construction at Coppercliff, Ontario. This refinery is expected to reach production in 1930. Electrolytic copper reached 18 cents in 1929, the highest price recorded since 1919.

Table 121.—Production of Copper from Canadian Ores, 1886-1929

Year	Pounds	Value	Cents per pound	Year	Pounds	Value	Cents per pound
		\$				\$	
1886.....	3,505,000	385,550	11-00	1909.....	52,493,863	6,814,754	12-982
1887.....	3,260,424	366,798	11-25	1910.....	55,692,369	7,094,094	12-738
1888.....	5,562,864	927,107	16-66	1911.....	55,648,011	6,886,998	12-376
1889.....	6,809,752	936,341	13-75	1912.....	77,832,127	12,718,548	16-341
1890.....	6,013,671	947,153	15-75	1913.....	76,976,925	11,753,606	15-269
1891.....	9,529,401	1,226,703	12-87	1914.....	75,735,960	10,301,606	13-602
1892.....	7,087,275	818,580	11-55	1915.....	100,785,150	17,410,635	17-275
1893.....	8,109,856	871,809	10-75	1916.....	117,150,028	31,867,150	27-202
1894.....	7,708,789	736,960	9-56	1917.....	109,227,332	29,687,980	27-180
1895.....	7,771,639	836,228	10-76	1918.....	118,769,434	29,250,536	24-628
1896.....	9,393,012	1,021,960	10-88	1919.....	75,053,581	14,028,265	18-691
1897.....	13,300,802	1,501,660	11-29	1920.....	81,600,691	14,244,217	17-456
1898.....	17,747,136	2,134,980	12-03	1921.....	47,620,820	5,953,555	12-502
1899.....	15,078,475	2,655,319	17-61	1922.....	42,879,818	5,738,177	13-382
1900.....	18,937,138	3,065,922	16-19	1923.....	86,881,537	12,529,186	14-421
1901.....	37,827,019	6,096,581	16-117	1924.....	104,457,447	13,604,538	13-024
1902.....	38,804,250	4,511,383	11-626	1925.....	111,450,518	15,649,882	14-042
1903.....	42,684,454	5,649,487	13-235	1926.....	133,094,942	17,490,300	*
1904.....	41,383,722	5,306,635	12-823	1927.....	140,147,440	17,195,487	*
1905.....	48,092,753	7,497,660	15-590	1928.....	202,696,046	28,598,249	*
1906.....	55,609,888	10,720,474	19-278	1929.....	248,120,760	43,415,251	*
1907.....	56,979,205	11,398,120	20-004				
1908.....	63,702,873	8,413,876	13-208	Total.....	2,639,214,206	430,260,309	

Since 1926 the value of Canada's copper production was computed according to the note on page 269.

Table 122.—Production of Copper in Canada, by Provinces and by Sources, 1928 and 1929

Production	1928		1929	
	Pounds	Value	Pounds	Value
		\$		\$
By PROVINCES—				
Quebec.....	33,697,949	4,909,791	55,337,169	10,019,901
Ontario.....	66,607,510	8,770,149	88,879,853	14,622,572
British Columbia.....	102,283,210	14,902,664	103,903,738	18,772,778
Yukon.....	*107,377	15,645		
Total.....	202,696,046	28,598,249	248,120,760	43,415,251
By SOURCES—				
In blister copper produced.....	124,824,371	18,322,883	160,190,580	28,059,843
In copper sulphate produced.....	192,850	28,098	154,357	27,950
In ores exported.....	51,235,921	7,470,763	69,555,356	12,594,388
In nickel-copper matte exported.....	26,442,904	2,776,505	18,220,467	2,733,070
Total.....	202,696,046	28,598,249	248,120,760	43,415,251

*Copper in silver-lead ores exported during 1925-1928 inclusive.

Table 123.—Production of Refined Copper in Canada, 1916-1929

Year	Tons	Year	Tons
1916.....	483	1923.....	824
1917.....	3,901	1924.....	1,768
1918.....	3,809	1925.....	170
1919.....	3,467	1926.....	10,581
1920.....	2,590	1927.....	9,191
1921.....	2,143	1928.....	8,806
1922.....	365	1929.....	3,518

Table 124.—Production of Copper Sulphate in Canada, 1921-1929

Year	Pounds	Year	Pounds
1921.....	643,919	1926.....	404,862
1922.....	230,835	1927.....	566,825
1923.....	307,135	1928.....	771,400
1924.....	127,301	1929.....	617,430
1925.....	121,746		

The Consolidated Mining and Smelting Co. Ltd. of Trail, B.C., is the only company producing copper sulphate in Canada, the output being used by them in their own plant. Formerly the Coniagas Reduction Company at Thorold, Ontario, was also a producer.

QUEBEC

Production of copper from the province of Quebec included the estimated recovery of copper contained in concentrates shipped from the Consolidated Copper and Sulphur Company, Limited (formerly the Eustis mine) and the copper in blister copper made at the Noranda smelter from Quebec ores.

ONTARIO

Statistics of copper production in Ontario for 1929 included the copper contained in converter copper made at Port Colborne, Ontario, by the International Nickel Company, Limited, the copper in nickel-copper matte exported by the same company; the recoverable copper in flotation concentrates exported by silver-cobalt and copper-lead-zinc mines, and the recoverable copper in concentrates exported by the Argonaut Gold mine.

The bounty offered by the Ontario government on copper 95 per cent pure and on copper sulphate produced from ore mined and refined in the province was never gained and the Act, known as the *Metal Refining Bounty Act* warranting the bounty, which expired April 10, 1917, was not re-enacted.

BRITISH COLUMBIA

British Columbia was credited in 1929 with a production of 103,903,738 pounds, the greatest of any year on record, and as compared with 102,283,210 pounds in 1928. The output from this province amounted to 42 per cent of the total Canadian production for 1929 as against 50 per cent in 1928.

In this total there are included the quantities of blister copper produced at Anyox by the Granby Consolidated Mining, Smelting and Power Company; blister copper made by the Consolidated Mining and Smelting Company at Trail; copper contained in copper sulphate made by the same company; and the copper estimated as recoverable from ores and concentrates exported. The principal copper-producing mines in British Columbia are the Britannia mine on Howe Sound which ships its concentrates to Tacoma, Washington, U.S.A.; the Hidden Creek and Bonanza mines on Portland Canal; and the Copper Mountain Mine, owned and operated by the Grandby Consolidated Mining, Smelting and Power Company, Limited. The Hidden Creek and Bonanza ores are smelted at the Anyox smelter and the Allenby concentrates, from Copper Mountain ore, were shipped to the Trail and Tacoma smelters. Small shipments were made from several other mines to both Trail and Foreign smelters.

Table 125.—Quantity and Value of Copper Produced in Canada, by Provinces, 1919-1929

(For production in previous years see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Manitoba		British Columbia		Yukon	
	lb.	\$	lb.	\$	lb.	\$	lb.	\$	lb.	\$
1919.....	2,691,695	503,105	24,346,623	4,550,627	3,848,000	625,775	44,502,079	8,317,884	165,184	30,874
1920.....	880,638	153,724	32,059,993	5,596,392	3,062,577	534,604	45,319,771	7,911,019	277,712	48,478
1921.....	352,308	44,045	12,821,385	1,602,930			34,447,127	4,306,580		
1922.....			10,943,636	1,404,477			31,936,182	4,273,700		
1923.....			31,056,800	4,565,227			55,224,737	7,963,959		
1924.....	1,893,008	246,546	37,113,193	4,833,622			65,451,246	8,524,370		
1925.....	2,510,141	352,474	59,718,777	5,577,311			69,221,600	9,720,097		
1926.....	2,674,058	368,886	41,312,867	4,828,964			89,108,017	12,292,450		
1927.....	3,119,848	403,084	45,341,295	4,946,533			91,686,297	11,845,870		
1928.....	33,697,949	4,909,791	66,607,510	8,770,149			102,283,210	14,902,664	107,377	15,645
1929.....	55,337,169	10,019,901	88,879,853	14,622,572			103,903,738	18,772,778		

* Includes small quantities produced in 1925, 1926 and 1927 but not reported until 1928.

Table 126.—Imports into Canada and Exports of Copper, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
IMPORTS—						
Copper in bars or rods, when imported by manufacturers of trolley, telegraph and telephone wires, electric wires and electric cables for use only in the manufacture of such articles in their own factories.....	26,384,000	3,719,260	36,063,400	5,537,148	54,824,600	9,922,096
Copper in bars or rods, in coil or otherwise, in lengths of not less than 6 feet, unmanufactured.....	732,100	128,144	539,300	102,740	719,200	164,642
Copper in blocks, pigs or ingots.....	3,795,607	510,771	7,883,600	1,176,941	12,084,000	2,246,600
Copper, old and scrap.....	5,817,100	737,029	5,606,300	785,141	4,958,200	827,832
Copper, ore and concentrates.....	500	530	100	52		
Copper, in strips, sheets or plates not polished or coated.....	1,836,700	385,477	2,586,700	521,559	2,806,300	698,974
Copper tubing in lengths of not less than 6 feet, and not polished, bent or otherwise manufactured.....	2,124,343	506,745	2,549,901	602,730	2,662,706	721,369
Copper wire, plain, tinned or plated.....	434,372	108,662	827,059	217,735	937,858	267,464
Copper wire cloth, or woven wire of copper.....		19,580		14,128		9,613
Copper wire, single or several, covered with cotton, linen, silk, rubber or other material, including cable so covered.....		509,312		677,923		809,729
Copper, all other, manufactures of, n.o.p.....		644,534		1,074,156		1,313,811
Copper, precipitate of, crude.....			3,825	102		
Anodes of nickel, zinc, copper, silver or gold.....		10,050		15,853		16,127
Copper, sub-acetate of, or verdigris, dry.....	3,389	688	410	94	681	177
Copper, sulphate of (blue vitriol).....	4,110,695	198,553	3,741,971	190,515	2,118,304	114,637
Copper, sulphate of, dehydrated, for agricultural or spraying purposes.....	586,426	29,696	1,627,074	84,130	2,252,122	122,056
Copper rollers adapted for use in calico printing.....		5,526		21,003		37,664
Total.....		7,514,557		11,021,959		17,272,791
EXPORTS—						
Copper, fine, contained in ore, matte regulus, etc.....	72,841,200	7,371,542	76,427,900	7,023,884	86,999,100	8,944,965
Copper, blister.....	54,258,800	6,667,270	104,764,700	15,375,344	148,278,500	26,711,867
Copper, old and scrap.....	5,912,500	602,494	8,061,700	869,839	11,559,600	1,574,712
Copper, pig.....	11,200	1,734				
Copper in bars, rods, strips, sheets, plates and tubing.....	248,100	63,165	158,200	40,988	132,100	35,900
Copper wire and cable.....		199,817		259,430		119,030
Copper mfrs., n.o.p.....		46,757		25,930		13,522
Total.....		14,952,779		23,595,415		37,399,996

Table 127.—Monthly Average Prices of Copper (Electrolytic), New York and London, 1927-1929

(From the *Engineering and Mining World*)

	New York (In cents per pound)			London (£Sterling per long ton)		
	1927	1928	1929	1927	1928	1929
January.....	12-990	13-854	16-603	62-375	66-575	78-602
February.....	12-682	13-823	17-727	61-119	66-381	83-538
March.....	13-079	13-845	21-257	62-641	66-443	98-356
April.....	12-808	13-986	19-500	61-526	66-500	89-405
May.....	12-621	14-203	17-775	60-881	67-216	83-727
June.....	12-370	14-527	17-775	59-881	68-738	84-013
July.....	12-532	14-527	17-775	60-089	68-670	84-043
August.....	12-671	14-526	17-775	62-227	68-750	84-250
September.....	12-040	14-724	17-775	61-830	69-800	84-363
October.....	12-058	15-202	17-775	62-256	71-935	83-978
November.....	13-319	15-778	17-775	63-761	74-750	82-202
December.....	13-774	15-844	17-775	66-181	75-000	82-569
Average.....	12-920	14-570	18-107	62-064	69-230	84-921

Table 128.—World Production of Copper, 1925-1929

(Imperial Institute Publication)

(Short tons)

Producing country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	106	121	198	76	76
Northern Rhodesia (smelter).....	83	793	3,685	6,642	6,122
Southern Rhodesia (smelter).....	1,888	8	.....	122	340
South-West Africa (d).....	9,184	9,856	11,760	12,432	13,888
Union of South Africa.....	8,618	9,723	10,220	9,701	9,937
Canada.....	55,726	66,547	70,074	101,348	124,060
Cyprus.....	3,881	3,368	4,480	5,488	6,384
India (estimated).....	5,488	6,496	6,720	6,272	8,848
Australia.....	13,235	9,769	11,170	10,602	14,349
Papua (years ended June 30).....	601	1,858	134	.....	.....
Total.....	99,000	109,000	119,060	152,060	184,000
FOREIGN COUNTRIES					
Austria.....	2,028	2,467	2,572	3,345	2,294
Bulgaria (ore).....	1,635	2,056	12,052	12,029	34,580
Czechoslovakia.....	597	1,014	1,700	1,791	(c)
Finland.....	1,539	1,092	909	2,102	(c)
France.....	160	(a)	271	(c)	(c)
Germany.....	26,955	30,520	30,061	28,895	31,948
Italy.....	913	1,823	1,865	906	(c)
Jugoslavia.....	8,048	11,700	11,424	14,560	22,400
Norway.....	15,058	14,907	13,629	19,597	20,987
Portugal (estimated).....	3,808	2,240	3,360	2,240	4,480
Rumania (smelter).....	147	208	237	114	158
Russia (estimated).....	7,280	13,216	15,008	22,288	29,120
Spain.....	52,294	48,691	56,000	59,360	63,840
Sweden.....	235	782	864	682	(c)
Algeria.....	1,432	(a)	287	.....	67
Belgian Congo (smelter).....	99,323	88,889	98,278	123,962	151,007
French Equatorial Africa.....	336	423	551	260	(c)
French Morocco.....	.....	13	.....	.....	.....
Tunis (Ore).....	.....	.....	82	.....	.....
Cuba.....	11,763	13,033	15,568	18,869	16,486
Mexico.....	67,768	59,264	74,445	72,208	95,409
United States.....	839,059	872,509	824,980	904,895	1,006,202
Argentina.....	7,976	8,977	9,622	9,953	7,923
Bolivia (exports).....	268,103	(b)	267,463	316,141	352,519
Chile.....	40,635	47,332	60,703	62,778	(c)
Peru.....	1,120	1,120	168	.....	.....
Venezuela (estimated).....	73,289	74,257	73,382	75,214	79,076
Japan (smelter).....	1,117	1,898	1,107	670	603
Korea (smelter).....	.....	.....	.....	15	72
Turkey (black copper).....	.....	.....	.....	.....	.....
Total.....	1,534,400	1,579,200	1,556,800	1,736,000	1,948,800
World's Total.....	1,635,200	1,691,200	1,680,600	1,892,800	2,128,000

(a) Ore; copper content not stated.

(b) Estimated.

(c) Information not available..

(d) Years ended March 31 of the year following that stated.

METALS OF THE PLATINUM GROUP

Metals of the platinum group produced from Canadian ores include platinum, palladium, rhodium, iridium, etc., recovered in the refining of nickel-copper matte from the Sudbury district; minor quantities of platinum from British Columbia placers and some platinum and palladium recovered from ores smelted at Trail, British Columbia.

Canada probably stands fourth in the world's production of these metals, larger amounts coming from Russia, South Africa and Colombia, South America. In British Columbia, small quantities of platinum are found in placer deposits with alluvial gold and black sands; in Ontario these rare metals occur with the nickel-copper-sulphide ores of the Sudbury district. Copper-nickel matte containing the precious metals is made at Coniston, and at Coppercliff by the International Nickel Company, Limited. The Coppercliff matte is shipped either to the United States, for manufacture into monel metal, or to Port Colborne, Ontario, for refining. When the copper and nickel are removed, the residues are further refined for the recovery of gold, silver, platinum and palladium and smaller amounts of rhodium and iridium. The Coniston matte is shipped to Clydach, Wales, where the metals of the platinum group are recovered in the refining process.

An estimate of 200,000 ounces is made for the world's platinum production in 1929. This figure, however, is rather speculative owing to the difficulty in obtaining accurate information regarding the Russian output.

A considerable increase in the Canadian production of the platinum group metals will almost certainly result on completion of the elaborate mining and metallurgical developments of the International Nickel Company at Sudbury, Ontario.

Table 129.—Production of the Platinum Group Metals in Canada, 1928 and 1929

	Platinum		Palladium, Rhodium Iridium, etc.	
	Ounces	Value	Ounces	Value
1928		\$		\$
Ontario.....	10,452	704,360	13,087	605,563
British Columbia.....	80	4,549	520	22,270
Total.....	10,532	708,909	13,607	627,833
1929				
Ontario.....	12,474	843,928	17,141	802,453
British Columbia.....	45	2,828	177	6,836
Total.....	12,519	846,756	17,318	809,289

Table 130.—Production of Platinum in Canada from Alluvial Sands, 1920-1929

(For years 1887 to 1919 see 1928 Mineral Production of Canada)

Year	Fine ounces	Value	Year	Fine ounces	Value
		\$			\$
1920.....	17	791	1925.....	6	715
1921.....	23	1,558	1926.....	50	4,258
1922.....	12	1,154	1927.....	11	960
1923.....	7	816	1928.....	49	2,819
1924.....	5	569	1929.....	28	1,699

Table 131.—Production of Metals of the Platinum Group, 1920-1929

(From 1887 to 1919 see Mineral Production of Canada, 1928)

Year	Platinum				Palladium	
	Lode		Placer			
	Fine oz.	\$	Fine oz.	\$	Fine oz.	\$
1920.....	{(c) 489 (d) 89	31,298 5,665	17	719	(c) 739 (d) 174	11,096 26,613
1921.....	269	21,014	23	1,585	590	47,060
1922.....	458	44,709	12	1,154	724	138,560
1923.....	1,210	141,010	7	816	1,732	811,993
1924.....	9,181	1,090,858	5	569	8,923	608,727
1925.....	8,692	1,027,477	6	715	7,856	9,790
1926.....	9,471	919,349	50	4,258	9,790	11,247
1927.....	11,217	716,653	11	960	11,247	541,319
1928.....	10,483	706,090	49	2,819	11,909	511,998
1929.....	12,491	845,057	28	1,699	12,408	471,614

Year	Rhodium		Ruthenium		Osmium		Iridium	
	Fine oz.	\$	Fine oz.	\$	Fine oz.	\$	Fine oz.	\$
1920.....	390	1,249			(f) 102			
1921.....	20				(f) 11			
1922.....	256	3,433			(f) 391	31,280		
1923.....	56							
1924.....	104	18,540						
1925.....	206	27,500	78	2,106	69	4,924	98	26,460
1926.....	367				(f) 432	40,242	79	16,590
1927.....	204	9,969	16	791			14	3,252
1928.....	222	6,853	31	1,073			45	4,945
1929.....	895	20,951	561	16,331			242	78,553
1929.....	3,037	151,850	1,376	66,048			497	119,777

(c) Recovery of platinum group metals at International Nickel Company's plant, New Jersey, U.S.A. Not necessarily all from Sudbury ores.

(d) Crude oz.

(e) Included with platinum and palladium.

(f) Includes osmium, iridium and ruthenium.

Platinum is recovered in a small way at the Royal Mint in the form of platinum black a dull black powder of metallic platinum, obtained from the treatment of dental and old jewellery scrap. The following tables show the recoveries since 1923.

Table 132.—Recovery of Platinum "Black", at the Royal Mint, Ottawa, 1923-1929

	Platinum	
	Ounces gross	Value
		\$
1923.....	4.520	393.47
1924.....	16.186	1,408.99
1925.....	9.500	*
1926.....	10.700	*
1927.....	54.150	*
1928.....	16.350	*
1929.....	34.200	*

*No sales.

Table 133.—Imports into Canada and Exports of Platinum, 1927-1929

	1927		1928		1929	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		\$		\$		\$
IMPORTS—						
Crucibles.....		8,581		10,838		13,019
Wire and bars, strips, sheets or plates.....		94,538		136,777		157,774
Retorts, pans, condensers, etc.....		26,901		2,881		41,113
Total.....		130,020		150,496		211,906
EXPORTS—						
Ores and concentrates.....	771	52,660	1,212	77,908	2,798	220,200
Old and scrap.....	221	15,789	424	27,463	112	5,319
Total.....		68,449		105,371		225,519

Table 134.—Monthly Average Prices of Refined Platinum, 1927-1929

(From *The Engineering and Mining World*)

(In dollars per fine ounce)

Month	1927	1928	1929
	\$	\$	\$
January.....	109-520	79-280	70-000
February.....	107-545	84-783	70-000
March.....	108-000	80-000	70-000
April.....	101-885	80-030	70-000
May.....	84-680	78-000	68-615
June.....	72-000	78-000	68-000
July.....	72-000	78-000	68-000
August.....	72-000	78-000	68-000
September.....	72-000	78-000	66-000
October.....	72-000	78-000	65-000
November.....	72-000	76-417	65-000
December.....	72-000	74-480	63-240
Average.....	84-636	78,580	67-655

Table 135.—Platinum Metals Consumed in the United States as Reported by Refiners and by Industries, 1928 and 1929

(From *Mineral Resources of the United States, 1929.*)

(In Troy ounces)

Industry	Platinum	Palladium	Iridium	Others	Total	Percentage of total
1928						
Chemical.....	18,529	1,252	113	135	20,029	10-68
Electrical.....	21,316	9,150	1,525	2	31,993	17-07
Dental.....	10,930	12,270	167	10	23,377	12-47
Jewellery.....	93,468	4,965	3,260	815	102,508	54-77
Miscellaneous.....	5,431	2,136	963	850	9,380	5-01
Total.....	149,674	29,773	6,028	1,812	187,287	100-00
1929						
Chemical.....	20,260	1,345	113	233	21,951	11-00
Electrical.....	20,746	18,856	1,014	89	40,705	21-00
Dental.....	13,051	12,156	788	236	26,231	14-00
Jewellery.....	84,039	4,451	3,737	851	93,078	49-00
Miscellaneous.....	7,234	1,048	347	1,025	9,654	5-00
Total.....	145,330	37,856	5,999	2,434	191,619	100-00

Table 136.—World Production of Platinum (a), 1912-1929

(In troy ounces, fine platinum)

(From *The Mineral Industry* 1929)

Year	Abyssinia	Australia	Canada (b)	Columbia	Japan	Russia	South Africa (f)	United States (b)	Total
1912..		463	497 (d)	27,071		(c) 250,000		1,005	279,036
1913..		335	311 (d)	17,635		(c) 210,000		1,034	229,315
1914..		185	..... (d)	16,264		(c) 202,000		1,484	219,933
1915..		43	475 (d)	18,749		(c) 104,000	(e)	1,190	124,500
1916..		62	1,040 (d)	25,592		(c) 53,000	(e)	2,780	82,500
1917..		197	1,036 (d)	26,421		98,474	(e)	6,280	132,400
1918..		461	705 (d)	34,266		43,181	(e)	9,740	89,928
1919..		162	690 (d)	32,236	1,575	39,425	(e)	10,460	87,803
1920..		640	4,345 (c)	33,500	4,830	11,323	(e)	11,500	69,300
1921..		189	5,412 (c)	34,000	8,014	5,500		2,899	55,200
1922..		61	4,802 (d)	43,574	7,196	22,500		1,998	77,600
1923..		445	6,810 (d)	40,676	4,665	34,700		2,114	96,000
1924..		490	9,186 (d)	46,533	6,956	56,900		3,523	130,100
1925..		573	8,698	45,000	4,519	94,800	5,490	4,325	164,800
1926..	640	397	9,521	44,600	5,873	92,700	16,773	4,923	175,700
1927..	1,200	226	11,228 (e)	45,800	6,169 (e)	100,000	25,043	4,449 (e)	194,000
1928..	2,400	.....	10,532	50,000 (e)	1,459	100,000 (e)	29,100 (e)	4,631 (e)	198,000
1929..	4,400	.....	12,519	.....	.....	.....	31,700 (e)	5,620 (e)	200,000

(a) Estimated content of fine platinum contained in crude platinum output. There has been a small production in some years from India, Borneo, Japan and other countries, but none of importance.

(b) Platinum of domestic source recovered by refiners. For total Canadian production see table 131.

(c) Estimated by J. M. Hill, U.S. Bureau of Mines.

(d) Exports.

(e) Estimated.

(f) All platinum group metals.

CHAPTER FIVE

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics, Showing Production by Provinces, Imports, Exports, Prices and World Output Tables on Aluminium, Antimony, Chromite, Iron Ore, Pig Iron and Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten.

1. General Review

Several metallic minerals, produced or treated in each instance by a single operator, or perhaps by a few operators, only, have been grouped in this report for consideration as a single industry. There is little that can be said in a general way about these various producers. Iron and steel, and aluminium are products of large, well-organized concerns, however both of these products are made in Canada solely from imported ores. Aluminium smelting is, therefore, of interest to the mining industry wholly because of the processes employed in the reduction of the metal from bauxite ore. Iron ore is found in Canada in very extensive deposits, but as the grade available cannot be economically used without beneficiation, very little Canadian ore has been mined in recent years. Imported iron ore used in Ontario is mostly from the Mesabi range, Minnesota, U.S.A., while in the Maritime Provinces, Wabana ore, mined on Bell Island, Newfoundland, is chiefly used.

Other metallic mineral industries reviewed in this chapter, include the production of antimony, chromite, manganese, mercury, molybdenum, tin and tungsten these industries are, however relatively small, and their importance is largely determined by the extent of available supplies from other countries. When, as during the great war, production from other sources was insufficient to meet the increased demands for such products as chromite and manganese, the output from Canadian deposits found ready markets. At other times, with larger supplies available, from various foreign sources, operation of the Canadian properties has been found somewhat difficult owing to the keen competition of these other producers.

During the great war, some of these smaller industries attained very considerable importance, and it is always possible, that some future commercial development may occur that will lead once, again, to an appreciable expansion in these somewhat neglected fields.

For historical purposes and to provide the interested reader with the available data, tables have been prepared for this report that set out the known facts regarding production in these industries.

In 1929 the miscellaneous group included two producing titaniferous iron ore properties in Quebec; two developing molybdenite mines in the same province, and another of this mineral in British Columbia. One tungsten deposit was under development in Nova Scotia, and in Manitoba exploratory work was done on the tin, lithium and beryllium bearing dike rocks of the Winnipeg river section. A chromite occurrence and cinnabar deposit were under development in British Columbia and radio active mineral deposits were investigated in the Bancroft area in Ontario.

Table 137.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1928 and 1929

	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	\$	Male	Female	\$
Salaried Employees—						
Total.....	4	1	7,850	5		11,090
Wage-Earners—						
Surface.....	35		54,036	62		31,747
Underground.....	22			27		
Total.....	57		54,036	89		31,747
Total.....	61	1	61,886	94		42,837

Table 138.—*Wage-Earners in the Miscellaneous Metal Mining Industries in Canada, by Months, 1928 and 1929

Month	1928				1929			
	Number of wage-earners				Number of wage-earners			
	Surface	Under-ground	Mill	Total	Surface	Under-ground	Mill	Total
January.....	14	4		18				
February.....	24	16		40				
March.....	24	16		40				
April.....	21	15		36				
May.....	21	13		34	8			8
June.....	30	22		52	40	23	6	69
July.....	29	22		51	42	26	6	74
August.....	24	12		36	40	20	8	68
September.....	32	12		44	27	20	8	55
October.....	37	12		49	40	20	8	68
November.....	26	12		38	12	20	8	40
December.....	19	4		23	12	20	8	40

*See note page 37.

2.—Commodity Statistics on Aluminium, Antimony, Beryllium, Bismuth, Cadmium, Chromite, Iron Ore, Pig Iron, Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten

ALUMINIUM

While, so far, no commercial ores of aluminium have been discovered in Canada, production of aluminium from imported ores, chiefly mined in the United States, has been carried on in Canada at Shawinigan Falls, Quebec, since 1903, and in 1926 a new plant was built at Arvida near Lake St. John on the upper reaches of the Saguenay to increase the output of this metal by the only Canadian producer, the Aluminium Company of Canada. Both plants still use bauxite from the United States but it is expected that the Arvida plant, because of its accessibility to tide-water, will be able to bring in its raw material more cheaply by water from British Guiana than is now possible by rail, from United States mines.

As there is only one producing company in this industry, statistics regarding the smelting operations have been included with data supplied by the smelters producing non-ferrous metals from Canadian ores. Production of aluminium hollowware, such as kitchen utensils, and other fabricated products, is reviewed annually in the Bureau's report on the *Manufactures of the Non-Ferrous Metals*.

Aluminium is a product of the electric furnace. Alumina, which has previously been recovered by chemical means from bauxite, is dissolved in molten cryolite, in an electric furnace and a low voltage current is passed through the melt to decompose the oxide into metallic aluminium and oxygen; the metal sinks to the bottom of the crucible. The free oxygen attacks the carbon of the furnace electrode forming carbon dioxide gas and for this reason the electrode consumption is high. Theoretically, there should be no loss of cryolite but in actual operations losses occur, which must be made good from time to time. All cryolite ore is obtained from Greenland. Aluminium is used in the manufacture of alloys with other metals including copper, nickel, cobalt, iron, antimony, tin, zinc and magnesium, and there are many uses for the pure metal itself. Pure aluminium powder is used in the thermit process to reduce the oxides of certain metals to the metallic state. In the manufacture of some alloys, metals of low carbon content are required and in the preparation of these metals from their oxides, reduction by aluminium is found very desirable, and a great improvement over the older method of reduction by carbon. Powdered aluminium is also used in precipitation of gold and silver from cyanide solutions and because of its great affinity for oxygen, it is sometimes employed as a de-gasifier or a de-oxidizer in the manufacture of steel.

Consumption of aluminium is increasing with remarkable rapidity. This metal and its alloys are now being utilized in the construction of electrical transmission lines, motor cars, railroad coaches, street cars, oil tanks, radio equipment, window frames, flooring, girders, aircraft, and a host of other manufactures.

Table 139.—Imports of Aluminium and its Products into Canada and Exports of Aluminium, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
IMPORTS—						
Alumina.....	253,235,300	6,036,019	65,748,300	1,494,545	910,000	25,026
Bauxite ore†.....			261,767,100	2,842,237	284,477,400	3,202,728
Cryolite ore.....	2,448,300	164,437	6,926,500	297,629	4,801,900	194,638
Aluminium—						
Ingots or blocks†.....			119,018	29,340	317,091	76,411
Bars and rods†.....			179,474	59,523	533,604	174,659
Sheets, strips or plates†.....			646,552	190,584	701,353	220,357
Ingots, blocks, bars, rods, strips, sheets or plates*.....	1,114,511	331,335	451,166	136,362		
Leaf or foil.....		260,936		233,011		197,164
Tubing.....	97,644	50,128	87,468	46,430	144,840	70,446
Net floats for sea or lake fishing only†.....				637		
Household hollow-ware.....		271,680		284,740		393,577
Manufactures, n.o.p.....		780,676		1,110,090		1,482,288
Total.....		7,895,211		6,725,128		6,037,294
EXPORTS—						
Aluminium—						
Bars, blocks, etc.....	51,902,400	10,544,195	40,597,100	8,049,367	72,970,800	13,210,023
Kitchen utensils and hollow-ware†.....				46,384		48,233
Scrap.....	543,500	66,534	1,800,300	249,066	3,416,200	455,326
Manufactures, n.o.p.....		403,230		712,874		1,430,927
Total.....		11,013,959		9,057,631		15,144,509

†April 1 to December 31, 1928.

*January 1 to March 31, 1928.

Table 140.—Monthly Average Prices of Ingot Aluminium, 1927-1929

(At New York in cents per pound 98 per cent grade)

(From the *Engineering and Mining World*)

Month	1927	1928	1929
January.....	26.270	24.300	24.300
February.....	26.000	24.300	24.300
March.....	26.000	24.300	24.300
April.....	26.000	24.300	24.300
May.....	26.000	24.300	24.300
June.....	26.000	24.300	24.300
July.....	26.000	24.300	24.300
August.....	26.000	24.300	24.300
September.....	26.000	24.300	24.300
October.....	25.600	24.300	24.300
November.....	25.000	24.300	24.300
December.....	24.785	24.300	24.300
Average.....	25.808	24.300	24.300

Table 141.—World Production of Aluminium, 1925-1929

(From *The Mineral Industry*, 1929)*

(Metric tons)

Country	1925	1926	1927	1928	1929
Austria.....	4,000	2,700	3,000	3,000	2,700
Canada.....	17,000	18,000	27,000	24,000	36,000
France.....	18,408	21,000	20,000	30,000	30,000
Germany.....	25,000	30,000	31,700	30,500	35,000
Great Britain.....	9,500	7,000	7,300	9,700	10,000
Italy.....	1,880	1,929	1,800	3,585	7,030
Norway.....	21,304	24,429	21,000	24,779	25,000
Switzerland.....	20,000	20,000	20,000	22,000	22,000
United States.....	66,000	68,000	72,000	95,440	102,270
Total.....	183,092	193,058	203,800	243,004	270,000

* The data in this table are as estimated by Robt. J. Anderson.

Table 142.—World Production of Bauxite, 1925-1929

(From *The Mineral Industry*, 1929)

(Metric tons)

Country	1925	1926	1927	1928	1929
Austria.....	(b) 4,000	(b) 5,000	(c)	(c)	(c)
British Guiana.....	197,458	222,518	192,986	165,422	167,000
British India.....	10,232	4,956	4,370	14,900	4,500
Dutch Guiana.....	85,501	46,400	169,700	203,000	240,000
France.....	406,421	408,600	540,000	597,810	643,021
Germany.....	1,767	(b) 15,000	2,400	6,860	3,000
Hungary.....	(c)	90,500	339,500	396,000	(c)
Italy (e).....	198,000	(b) 5,000	95,300	62,200	197,000
Jugo-Slavia.....	79,010	(b) 150,000	100,327	49,200	20,000
Rumania.....	(b) 7,000	745	1,706	650	(c)
Ireland.....	5,120	(b) 6,000	5,394	(b) 5,000	5,000
United States.....	321,622	398,546	326,289	381,454	365,777
Spain.....				181	180
Total.....	1,316,131	1,353,265	(b) 1,777,972	(b) 1,882,677	(b) 1,645,478

(b) Estimated. (c) Data not available. (d) The bauxite deposits in the Bihar Mountains in Rumania were not exploited until the Great War at which time they were owned by Hungary. (e) Istria included under Italy.

ANTIMONY

Ores of antimony are known to occur in British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Quebec and the Yukon. The greater part of the Canadian output of refined antimony was produced in the years 1907, 1909, 1915 and 1916 by the Consolidated Mining and Smelting Company of Trail, B.C., as a by-product in the treatment of silver-lead ores. The remainder was from the New Brunswick ores treated locally.

There is an occurrence of auriferous stibnite ore and native antimony associated with arsenopyrite, pyrite and galena that was worked at West Gore, Hants county, Nova Scotia, during the war period, the ore being concentrated at the mine to a 38 to 45 per cent antimony content.

No antimony was produced in 1929, but 1,596 pounds worth \$281, were recovered in 1926 from silver-lead-bismuth bullion obtained in the treatment of ores from the Cobalt district, exported for refining in the United States.

About 1850, stibnite and small quantities of native antimony were discovered in the slates and quartzites of Prince William, York county, New Brunswick. Attempts to smelt the ore locally failed, and for a time, the crude ore was shipped but this proved unprofitable and work was discontinued in 1890. In 1907 the deposit was re-worked and during the war period the ore was smelted and refined near lake George.

Antimony ores are rare in the province of Ontario, although it has been found in Hastings, Addington and Frontenac counties and with the silver of the Cobalt district. In South Ham, Wolfe county, Quebec, some work has been done on an antimony deposit.

There are several deposits of antimony in British Columbia. In the Bridge river area, Lillooet Mining Division, stibnite occurs in quartz. The ore contains, on the average, 40 to 60 per cent antimony, and is free from arsenic, zinc and lead; it also carries gold varying from a trace to one-half an ounce to the ton. A few shipments have been made from a deposit on the north fork of Carpenter creek in the Slocan district.

Antimony has also been found on Graham island, at Tatlayoko lake, Nanaimo district, and in the vicinity of Kamloops lake where it is associated with cinnabar.

In the Yukon territory antimony ores occur in the Carbon and Chieftain Hills near the Wheaton river.

Antimony is used in battery plates, grids, bearings, babbitt metal, solder, rubber goods, paints, fixtures, and for a variety of other purposes.

Table 143.—Production of Antimony in Canada, 1886-1929

Year	Antimony ore		Refined regulus		Antimony in silver-lead-bismuth bullion exported	
	Tons	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
1886.....	665	31,490				
1887.....	584	10,860				
1888.....	345	3,696				
1889.....	55	1,100				
1890.....	26½	625				
1891.....	10	60				
1892-1897.....						
1898.....	1,344	20,000				
1899-1904.....						
1905 (a).....	527					
1906 (a).....	782					
1907.....	2,016	65,000	63,850	5,108		
1908 (b).....	148	5,443				
1909.....	35	1,575	61,207	4,285		
1910.....	364	13,906				
1911-1914.....						
1915.....	1,341	81,283	59,440	11,888		
1916.....	885	94,537	107,185	41,823		
1917.....	361	22,000				
1918-1924.....						
1925.....					1,751	206
1926.....					1,596	281
1927.....						
1928.....						
1929.....						

(a) As recorded by the Nova Scotia Department of Mines: no value given.

(b) Exports.

Table 144.—Imports of Antimony into Canada, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Antimony, or regulus of.....	1,284,483	143,446	1,529,823	140,958	1,746,525	147,643
Antimony salts.....	37,975	8,233	16,930	3,837	58,829	8,703
Antimony salts for dyeing.....	14,734	2,533	6,096	1,490	220	119
Total.....		154,212		146,285		156,465

Table 145.—Monthly Average Prices of Antimony, 1927-1929

(Compiled from quotations given in the *Engineering and Mining World*—"Ordinaries" stand for Hungarian, Chinese or other "Foreign" brands)

(At New York in cents per pound)

Month	1927	1928	1929
	Ordinaries	Ordinaries	Ordinaries
January.....	13-910	10-863	9-558
February.....	14-509	10-842	9-548
March.....	12-801	10-083	9-531
April.....	14-166	9-865	9-462
May.....	12-975	11-019	8-957
June.....	12-447	9-750	8-845
July.....	11-880	9-540	8-543
August.....	11-826	10-181	8-778
September.....	11-073	10-813	8-709
October.....	11-165	10-841	8-538
November.....	10-763	10-109	8-583
December.....	11-195	9-748	8-420
Average.....	12-393	10-305	8-956

World Production of Antimony.—China is by far the greatest antimony-producing country in the world, and as consumption of antimony in that country is only 1 per cent of its production, large quantities are available for export. There are many valuable deposits in the various provinces of China, but in the province of Hunan alone there is said to be 2,000,000 tons, much of which has not been developed.

Table 146.—World Production of Antimony, 1925-1929

(In terms of metal)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

(short tons)

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Southern Rhodesia.....	20	32	.....	55	.....
India (ore).....	11	121	660	414	86
Australia.....	106	112	71	55	30
Canada.....	1	1	.....	.....	.....
FOREIGN COUNTRIES					
Austria.....	.....	34	1,180	1,260	784
Czechoslovakia.....	647	1,292	2,185	1,332	(a)
France.....	1,416	851	983	952	918
Italy.....	430	496	393	316	232
Jugoslavia.....	87	112	165	142	175
Spain.....	.....	19	15	9	(a)
Algeria.....	1,844	336	143	.....	.....
Morocco.....	.....	.....	.....	11	(a)
Mexico.....	1,476	2,885	2,121	3,944	2,987
United States.....	32	43	.....	41	.....
Bolivia (exports).....	2,157	4,800	4,427	3,905	4,165
Peru.....	19	109	133	155	(a)
Asia Minor (estimated).....	448	448	448	448	448
China (exports)—	.....	.....	.....	.....	.....
Ore.....	2,300	2,528	2,136	2,654	(a)
Crude.....	3,026	3,568	2,582	3,503	4,295
Regulus.....	18,754	19,935	17,423	18,138	22,116
Korea.....	.....	6	.....	.....	.....
Turkey.....	.....	.....	28	108	8
Argentina (exports of ore).....	44	.....	.....	.....	.....
Portugal.....	25	.....	.....	.....	.....
World's Total.....	31,360	35,840	33,600	35,840	38,080

(a) Information not available.

Beryllium

Shipments of beryl crystals were made to Germany in 1927 from a deposit in Lyndoch township, Ontario. Beryl occurrences in the pegmatites of eastern Manitoba were investigated during 1929. Interest has recently centred around the utilization of beryllium in both light and heavy alloys, a new plant for the recovery of metallic beryllium is reported under construction at Graz, Austria.

BISMUTH

Bismuth occurs in small quantities with ores of the Cobalt district and in ores treated at the Trail smelter in British Columbia. Some bismuth was recovered as metal in 1929 and some contained in silver-lead-bismuth bullion, was exported for treatment in United States smelters. During 1929 production of metallic bismuth and bismuth contained in exports amounted to 194,329 pounds valued at \$307,114.

"The Mineral Industry, 1927" makes the following statements regarding uses for bismuth:

While a very large portion of the bismuth metal produced finds its way into pharmaceutical compounds, we find that all the manufacturers buy the pure metal, and from it prepare the bismuth compounds used in making their preparations.

Outside of its pharmaceutical uses the only other important demand for the metal comes from the makers of so-called "fusible alloys." These are prepared according to many formulae, but almost always contain large amounts of bismuth.

Quaternary alloys containing lead, tin, cadmium, and bismuth can be produced having fusion points below 100°C., and by varying the proportions any desired fusion point may be obtained. Such alloys are much used as solders for making fusible links for automatic sprinklers and firedoors.

Table 147.—World Production of Bismuth, 1925-1929

(Pounds)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country and Description	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Northern Rhodesia (metal).....		4,800			
Canada—					
Metal.....	17,600	5,800	1,900	12,500	173,500
India—					
Ore.....			48	82	88
Australia—					
Ore, etc.....	23,000	16,500	13,500	15,200	6,500
FOREIGN COUNTRIES					
Germany (Saxony)—					
Bismuth-cobalt-nickel ore.....	14,300	15,200	9,100	8,100	(a)
Rumania (metal).....	100				
Spain—					
Ore.....	285,400	190,900	189,000	253,900	(a)
Metal.....	73,500	52,300	41,600	46,900	(a)
Argentina—					
Ore.....			400	2,100	(a)
Bolivia (exports)—					
Content of ore and concentrates.....	662,000	439,100	213,600	267,900	297,400
Japan—					
Metal.....	53,100	50,600	44,400	63,300	(a)

(a) Information not available.

Bismuth was also recovered as a by-product in the refining of lead and zinc in the United States.

CADMIUM

Cadmium was produced for the first time in 1928 at the Trail refinery of the Consolidated Mining and Smelting Company, Limited, as a by-product of the silver-lead-zinc ores treated there. The output of this metal during 1929 was valued at \$675,294.

"The Mineral Industry 1928" gives the following uses for cadmium.

There are four uses recently developed which account for the rapidly increasing demand for cadmium. It is being used in increasing amounts in making cadmium solders. The Udylyte process is a rust-proofing process, in which iron articles such as locks, small hardware, and automobile parts are electroplated with the metal, after which the work is heated in an oven for several hours at a temperature of from 150-200°C. The Cadalyte process, which is an electro-

plating process giving a bright silver-like finish, is being extensively used. Cadmium plating is also used in connection with chromium plating, the work being first given a cadmium coat, then followed by the final chromium plate.

Other important uses of the metal or its compounds include: A small amount added to silver alloys makes the silver whiter and more resistant to tarnish. Cadmium has also other uses in jewelry, giving with gold a green alloy. When added to aluminium which is to be used in making powder it improves the colour and luster of the powder and makes it more resistant to corrosion. Cadmium still continues to be extensively used in making fusible alloys. When added in small amounts to copper, the wire drawn from the alloy has greater strength for use in transmission lines without having its conductivity appreciably reduced. It is reported that cadmium is being used in the manufacture of tungsten light filaments. An alloy of cadmium bismuth and mercury is impregnated with tungsten powder, the mixture made into wire by the extrusion process, heated to drive off the alloy, and then finished by heating in a vacuum to consolidate the tungsten. It has been used in the form of wire for spraying-rods for use in metal spray processes, plaster casts and other objects being thus coated with a thin layer of the metal. Storage battery plates of cadmium are being recommended. Such batteries do not deteriorate when standing discharged.

For many years cadmium sulphide, a brilliant yellow pigment has been extensively used for painting street cars, passenger coaches and other objects and materials where freedom from attack of sulphurous gases was desired; the quantity thus used sometimes exceeding that used as metal. Cadmopone, or cadmium lithopone is much cheaper, and for many purposes it is just as satisfactory. It is a mixture of cadmium sulphide and barium sulphate, being similar to lithopone except that the yellow cadmium sulphide replaces the white zinc sulphide. The oxide, hydroxide, and sulphate are used for the electrolytes in the various cadmium-plating processes. Other cadmium compounds such as the chloride, iodide, bromide, and nitrate find various uses in the chemical industries.

Sources.—Practically all the world's production comes from the treatment of the impure zinc solutions used for preparing electrolytic zinc, so that the potential output of cadmium bears a very direct relation to the amount of electrolytic zinc produced. Some cadmium is produced from smelter fluedusts, and a certain amount from the purification of zinc solutions used for making lithopone.

Table 148.—World Production of Cadmium, 1925-1929

(Pounds)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada.....				491,894	773,976
Australia.....	400,661	358,912	346,773	385,616	445,907
FOREIGN COUNTRIES					
Belgium (exports).....		661	7,055	11,464	5,071
France.....	5,884	20,000	41,888	(a)	(a)
Germany (estimated).....	100,000	100,000	100,000	100,000	100,000
Poland.....	7,835	11,574	13,558	9,288	(a)
United States—					
Metal.....	(c) 502,824	(c) 810,428	(c) 1,074,654	1,875,896	2,481,427
Compounds (metal content).....		166,600	229,000	239,900	433,300
Mexico (b).....			200,122	779,431	1,413,092

(a) Information not available.

(b) Recorded as cadmium, but probably zinc-cadmium fume exported to the United States for treatment.

(c) Excluding cadmium content of cadmium sulphide produced.

CHROMITE

The mineral chromite (FeO , Cr_2O_3) is the commercial source of the metal chromium, which is of prime importance in the manufacture of chrome steel armour plate and other similar steels. Chromium is a necessary constituent of many high-speed cutting tools, and its use is well established in the manufacture of stainless steels, in which it makes up from 12 to 14 per cent of the alloy.

Quebec has been the main source of chromite ore in Canada. Rhodesia, India, and New Caledonia, supply over 90 per cent of the world's chromite.

During the war when the higher grades of ore from other continents were not easily obtainable, many low-grade deposits in Canada and the United States were opened up, and for a time considerable metallurgical research was done in Canada on the reduction of chromium-bearing ores. Chromium metal may be obtained from chromium oxide by reduction with aluminium. The metal made in this manner is very pure and free from carbon. In less pure form, it has been made in the electric furnace directly from the ore. The resultant product made in this manner contains small percentages of iron and carbon but not sufficient to cause any serious trouble when the metal is used in the manufacture of alloys. Ferrochrome, also a product of the electric furnace, is made from a good grade of chromite ore, and the iron chromite alloy runs about 60 to 70 per cent chromium. This alloy can then be added in the required amounts to a bath of molten steel. Ferrochrome requirements take about 40 per cent of the world's supply of chromite; about 35 per cent of the chromite produced is used in the manufacture of chromite refractories such as brick and other furnace linings, and 25 per cent is used in the manufacture of chemicals.

Considerable research on the plating of chromium has resulted in much success. Because it does not tarnish readily and as chromium plate has a brilliant blue-white lustre, the use of chromium as a plating material has been greatly extended in recent years.

There has been no important production of chromite in Canada since 1923 when 3,558 tons valued at \$52,650 were produced, in 1929 a property in British Columbia shipped 126 tons of this ore.

Systematic exploration and prospecting were carried on during the past year on chromite occurrences situated to the west of Lake Nipigon, Ontario.

Table 149.—Production of Chromite in Canada, 1886-1929

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1886.....	60	945	1911.....	157	2,587
1887.....	38	570	1912-13.....		
1888-93.....			1914.....	136	1,210
1894.....	1,000	20,000	1915.....	12,341	179,543
1895.....	3,177	41,300	1916.....	(a) 27,517	311,460
1896.....	2,342	27,004	1917.....	(a) 36,725	499,682
1897.....	2,637	32,474	1918.....	21,994	867,122
1898.....	2,021	24,252	1919.....	8,541	228,898
1899.....	2,010	21,842	1920.....	11,016	251,379
1900.....	2,335	27,000	1921.....	2,798	55,696
1901.....	1,274	16,744	1922.....	767	11,503
1902.....	900	13,000	1923.....	3,558	52,650
1903.....	3,509	51,129	1924.....		
1904.....	6,074	67,146	1925.....		
1905.....	8,575	93,301	1926.....		
1906.....	9,035	91,859	1927.....		
1907.....	7,196	72,901	1928.....		
1908.....	7,225	82,008	1929.....	126	900
1909.....	2,470	26,604			
1910.....	299	3,734	Total.....	187,853	3,176,443

(a) A portion of this ore was sold to a customs mill in the district and the final shipments of ores and concentrates in 1916 were 15,249 short tons valued at \$310,902 or an average of \$20.39 per ton; and 23,713 tons valued at \$581,796 or an average of \$24.54 per ton in 1917.

Table 150.—Production in Canada, and Imports of Chromite, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....						
IMPORTS—						
Bichromate of soda.....	1,030	121,209	1,045	122,378	126	900
Bichromate of potash.....	96	15,127	97	17,155	898	127,828
Brick, fire, chrome.....		52,565		56,375	84	14,955
						101,302

Table 151.—World Production of Chrome Ore, 1925-1929

(Short tons)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	502		423		
Southern Rhodesia.....	135,827	181,194	218,018	219,428	293,116
Union of South Africa.....	15,164	13,274	18,694	35,006	70,520
Cyprus (shipments).....	2,228	578	797		2,737
Canada.....					127
India.....	41,946	37,388	64,072	50,910	55,513
Australia.....	1,079	669			144
Total.....	197,120	232,960	302,400	305,760	422,240
FOREIGN COUNTRIES					
Greece.....	8,905	22,100	19,086	23,097	(a)
Jugoslavia.....	13,404	17,619	9,653	18,387	33,653
Russia (years ended Sept. 30).....	33,191	33,468	21,268	24,214	(a)
Cuba.....	33,410	39,800	17,950	32,088	44,531
United States.....	176	217	56	412	202
Brazil (exports).....		1,653	2,006	22	77
Japan.....	6,419	6,218	10,783	10,811	(a)
Turkey.....	22,400	22,400	20,192	13,061	17,833
New Caledonia.....	36,960	26,006	41,442	56,024	(b) 54,174
Guatemala (exports).....		59	(a)		
Total.....	156,800	168,000	145,600	179,200	212,800
World's Total.....	347,200	403,200	448,000	481,600	635,400

(a) Information not available.

(b) Exports.

IRON ORE

Iron ore was first discovered in Canada in the St. Maurice valley, Quebec, as early as 1667, or perhaps earlier. Count Frontenac mined ore there five years later and the samples, tested in France, were found to be of workable quality.

In 1730 M. Franchville was granted a licence by Louis XIV of France together with a subsidy of 10,000 "livres" to work the St. Maurice iron mines. The project contemplated the construction of a blast furnace which apparently was not successful for, in 1735, he surrendered his rights to the government. Some years later another licence and a subsidy were given La Compagnie des Forges which made not only the iron kettles that were needed by the pioneers for making sugar and soap but furnished the French government with cannon for military enterprises. In 1743 the plant again reverted to the crown and was operated by the government until the country passed into the hands of the British.

Nova Scotia with its large iron and steel industry is not at present a producer of iron ore. Deposits of iron ore of various kinds are numerous throughout a large part of the province, Nova Scotia ranks next to Ontario in the matter of total production, however the large deposits of high-grade iron ore in Newfoundland owned and operated by the British Empire Steel Corporation, are much more readily accessible and of a higher and more constant grade than the deposits in Nova Scotia and for that reason the local deposits are not mined.

Iron ore mining and smelting were carried on to a small extent in New Brunswick but the ore was low-grade and the operations did not prosper.

Iron ore was first mined and smelted in the province of Quebec early in the eighteenth century, and from that time until 1883 the industry was carried on almost continuously at Three Rivers in the St. Maurice district. Other furnaces using local ore were operated at Radnor Forges and at Drummondville, the last to shut down being the Drummondville furnace in 1911. The ores used were bog ores, with charcoal for fuel. The output of all the furnaces was small and the industry owed its success to the superior quality of the pig iron produced.

Furnaces have also been built at various times and places in attempts to smelt some of the other classes of ore found in the province, these were all short lived, and none achieved commercial success.

More iron ore has been produced in Ontario than in any other province to date but at the present time no properties are producing. About 1896 a system of bounties, inaugurated by the Federal and Provincial Governments to encourage the manufacture of iron and steel from native ores, had the desired effect of stimulating the industry and the following year, blast furnaces were erected at various points in the province. Strenuous efforts were made to use Ontario ores as far as possible and thus obtain advantages of the bounties offered.

As a result, iron mining and prospecting for iron ore were stimulated but the grade found was generally low and contained deleterious material to such an extent that it was soon found unprofitable to operate.

In northwestern Ontario about 1899, a deposit of hematite that later developed in to the Helen mine, was found, this mine proved the main source of Ontario's iron output for a number of years. The high grade ore was exhausted and the mine is now closed down. Ontario has a large supply of low-grade iron ore, but beneficiation processes must be applied to make these ores suitable for commercial use.

Production of iron ore in British Columbia has been almost negligible up to the present time, however the small production has not been caused so much by the lack of ore as by the scarcity of a market for the ore. Different varieties of iron ore are found in various parts of the province, the most important of which are the magnetite deposits which occur on the islands along the coast. In some deposits the sulphur content is high, which would necessitate a preliminary roasting before charging to the blast furnaces; the ores are easily mined, are close to tide-water and would supply for some years a small iron-smelting industry providing the local demand for the products would justify its establishment.

Prospecting expeditions in 1929 visited the large iron ore deposits of the Belcher islands in Hudson Bay and those of the Koksoak and Hamilton rivers in Ungava. It is stated that the Ungava deposits may afford, in the future, an almost inexhaustible supply of high grade iron ore.

Table 152.—Shipments of Iron Ore from Canadian Mines, by Provinces, 1920-1929

(For years 1886 to 1919 see Mineral Production of Canada, 1928)

(Short tons)

Year	Quebec	Ontario	British Columbia	Canada
1920.....	960	126,912	1,200	129,072
1921.....		58,499	1,010	59,509
1922.....	526	16,190	1,255	17,971
1923.....	69	30,447	243	30,759
1924.....	1,408	44	28	1,480
1925.....	3,978			3,978
1926.....	200			200
1927.....	2,029			2,029
1928.....	2,244			2,244
1929.....	2,748			2,748

Table 153.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1920-1929

(For years 1895 to 1919 see Mineral Production of Canada, 1928)

Year	To Nova Scotia	To United States	To Great Britain and Europe	Total shipments
	Short tons	Short tons	Short tons	Short tons
1920.....	624,596	.....	36,708	661,304
1921.....	178,519	.....	206,010	384,529
1922.....	311,482	.....	811,845	1,123,327
1923.....	451,483	.....	356,753	808,236
1924.....	174,602	.....	919,968	1,094,570
1925.....	384,795	.....	883,056	1,267,851
1926.....	465,961	.....	503,640	969,601
1927.....	480,767	68,354	946,569	1,495,680
1928.....	690,316	41,493	1,001,833	1,733,642
1929.....	763,168	85,501	850,370	1,699,039

Table 154.—Imports into Canada, and Exports of Iron Ore, 1928 and 1929

	1928		1929	
	Quantity	Value	Quantity	Value
	Short tons	\$	Short tons	\$
IMPORTS—				
Iron ore from United States.....	1,563,984	3,419,168	1,640,500	3,999,239
Iron ore from Newfoundland.....	584,096	584,118	743,713	743,736
Iron ore from Sweden.....	55,633	247,985	58,554	266,317
Iron ore from other countries.....	19,184	73,888	5,040	16,973
Total.....	2,222,897	4,325,159	2,447,807	5,026,265
EXPORTS— Total.....	2,615	12,500	3,859	19,461

PIG IRON AND FERRO-ALLOYS, STEEL AND ROLLED PRODUCTS

Statistics of pig iron, steel and rolled products, are regarded as belonging to "Manufactures" rather than to "Mining" but the close relation between the mining of iron ore and the production of pig iron and steel justifies the inclusion here of references to these secondary industries. The data given in this section have been taken from the Bureau's annual bulletin on *The Primary Iron and Steel Industry in Canada, 1929*.

Sales form the primary iron and steel industry (including pig iron, ferro-alloys, steel ingots and direct steel castings and rolled iron and steel products) in Canada during 1929 amounted to \$72,231,995, an increase of 16 per cent over the \$62,071,674 reported in the previous year which in turn was 36 per cent over the \$45,571,264 recorded for 1927.

Of the 45 firms engaged principally in this line of production, 18 were located in Ontario, 13 in Quebec, 6 in Nova Scotia, 4 in Manitoba, 3 in British Columbia and 1 in Alberta. These concerns reported fixed and working capital at \$109,446,529, employed a monthly average of 11,218 people to whom was paid \$18,534,681 in salaries and wages, and by manufacturing processes added \$39,717,399 to the value of purchased materials which cost \$32,514,596. An analysis of the sales values by provinces showed the following distribution: Ontario, \$43,739,532; Nova Scotia, \$16,044,488; Quebec, \$10,344,845; Manitoba, \$1,811,930; and Alberta and British Columbia, \$291,200.

1. (a) *Pig Iron*.—Blast furnace production of 1,080,160 long tons of pig iron showed a gain of 4 per cent over the 1928 output of 1,037,727 tons. About 70 per cent of the output, or 753,889 tons, was shipped to the makers' own plants, 324,759 tons were sold and the remainder of 1,512 tons, not otherwise accounted for, was probably in stock at the end of the year. Production for the year included 770,478 tons of basic iron, 221,644 tons of foundry iron and 88,038 tons of malleable iron.

Based on an estimated population in Canada of 9,796,800 persons in 1929, the per capita production of pig iron amounted to 247 pounds as against 241 pounds in the previous year, 167 pounds in 1927, and an average of 178 pounds in 1926.

Ontario produced 71 per cent of the Canadian output in 1929, the same as in the previous year. Nova Scotia accounted for the remainder in each year.

Four firms in Canada produced pig iron during 1929, namely: The Dominion Iron and Steel Co., Sydney, N.S.; The Steel Company of Canada, Ltd., Hamilton, Ont.; The Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ont.; and The Canadian Furnace Company, Ltd., Port Colborne, Ont.

Employees in blast furnace departments numbered 773 in 1929.

1. (b) *Ferro-alloys*.—Production of ferro-alloys in Canada during 1929 totalled 89,116 long tons as compared with 44,882 tons for last year. The following firms manufactured during 1929: Electro Metallurgical Company of Canada, Ltd., Welland, Ont. (including the Union Carbide Company of Canada); Canadian Carborundum Co., Ltd., Niagara Falls, Ont.; The Abrasive Company of Canada, Ltd., Hamilton, Ont.; The Exolon Company, Thorold, Ont.; and the Aluminum Company of Canada, Ltd., Arvida, P.Q. Only the first mentioned company has been included in the primary iron and steel industry, the other concerns being classified in other groups according to their principal products.

2. *Steel Ingots and Castings*.—Production of steel ingots and castings in 1929 was 1,378,024 tons, an increase of 12 per cent over the total of 1,234,719 tons for 1928. The year's figures included 1,309,606 tons of steel ingots and 68,418 tons of steel castings; practically all the ingots were intended for the further use of the makers while most of the castings were made for sale.

Per capita production in Canada of steel ingots and castings amounted to 316 pounds during the year under review, as compared with 288 pounds in 1928, an average of 213 pounds in 1927, and 185 pounds in 1926.

During the year 25 plants had furnaces for making steel ingots and direct steel castings. Quebec had 9 plants; Ontario, 7; Manitoba, 3; British Columbia 3; Nova Scotia, 2; and Alberta, 1. Employees in these steel plants numbered 4,594 in 1929.

3. *Rolled Products*.—Rolling mill sales were valued at \$50,758,322 in 1929 as compared with \$46,565,831 in 1928. During the year 1,607,063 long tons of iron and steel passed through the rolling mills and of this total 1,426,757 tons came from the producers' own plants and 180,036 tons were purchased.

The 15 rolling mills operated during 1929 were located as follows: Ontario, 7; Quebec, 4; Nova Scotia, 3; Manitoba, 1. The average number of employees in these plants in 1929 was 5,505.

Table 155.—Principal Statistics of the Primary Iron and Steel Industry in Canada, 1925-1929

Year	No. of plants	Capital employed	Average number of employees	Salaries and wages	(*) Cost of materials at works	Selling* value of products at works	Value added by manufacturing
		\$	\$	\$	\$	\$	\$
1925.....	32	82,593,940	5,101	7,291,172	16,433,911	35,337,685	18,903,774
1926.....	33	86,987,454	6,140	9,054,170	19,912,723	41,183,565	21,270,842
1927.....	36	96,295,734	7,396	11,809,198	18,993,940	45,571,264	26,577,324
1928.....	40	114,292,363	9,057	15,470,836	27,164,463	62,071,674	34,907,211
1929.....	45	109,446,529	11,218	18,534,681	32,514,596	72,231,995	39,717,399

*Figures of materials used are of purchased materials only, and production figures cover sales only.

Table 156.—Principal Statistics of the Pig Iron and Ferro-Alloys, Steel and Rolled Products Industry in Canada, by Provinces, 1928 and 1929

Province	Year	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of materials	Production	Value added by manufacturing
			\$		\$	\$	\$	\$
Nova Scotia.....	1928	6	29,978,715	2,121	3,263,144	7,067,650	15,625,206	8,557,556
	1929	6	28,626,944	2,150	3,352,388	7,789,915	16,044,488	8,254,573
Quebec.....	1928	10	10,282,082	1,737	2,433,334	1,652,038	7,350,581	5,698,543
	1929	13	11,765,863	2,624	3,569,143	2,670,576	10,344,845	7,674,269
Ontario.....	1928	16	72,098,748	4,709	9,092,742	17,859,303	36,926,646	19,067,343
	1929	18	66,941,099	5,915	10,985,718	21,591,863	43,739,532	22,147,669
Manitoba.....	1928	4	1,800,911	416	579,461	559,861	1,959,241	1,399,380
	1929	4	1,884,623	435	501,832	430,804	1,811,930	1,381,126
Canada*.....	1928	40	114,292,363	9,057	15,470,836	27,164,463	62,071,674	34,907,211
	1929	45	109,446,529	11,218	18,534,681	32,514,596	72,231,995	39,717,399

*Includes data for 3 plants in British Columbia and 1 in Alberta.

Table 157.—Materials Charged to Iron Blast Furnaces in Canada, 1929

Item	Quantity	Cost at furnace
Foreign iron ore.....long tons	1,924,579	\$ 6,904,374
Mill cinder, scale, slags, etc.....long tons	120,779	569,655
Scrap.....long tons	61,955	664,202
Limestone—		
From Canadian quarries.....short tons	130,239	210,752
From foreign sources.....short tons	468,793	616,283
Coke—		
From Canadian coal.....short tons	406,290	2,018,109
From imported coal.....short tons	680,140	3,601,018
Imported.....short tons	84,741	575,738
Total.....		15,160,131

Table 158.—Production of Pig Iron in Canada, by Grades, 1929

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
Pig Iron—	Long tons	Long tons	Long tons	\$
Basic.....	770,478	748,415	16,645	326,296
Pfoundry.....	221,044	2,888	237,281	4,754,979
Malleable.....	88,038	2,586	70,833	1,463,370
Total.....	1,080,160	753,889	324,759	6,544,645

Table 159.—Production of Ferro-Alloys in Canada, 1920-1929.

	Long tons		Long tons
1920.....	27,781	1925.....	25,709
1921.....	22,603	1926.....	57,000
1922.....	21,602	1927.....	56,230
1923.....	41,887	1928.....	44,482
1924.....	35,034	1929.....	89,116

Table 160.—Materials Used in the Steel Ingots and Castings Industry in Canada, 1929

Item	Unit of measure	Companies' own production	Purchased materials	
			Quantity	Cost at furnace
(a) Metals:—				\$
Pig iron.....	long ton	750,464	11,414	269,083
Spiegeleisen and ferromanganese.....	long ton		11,769	796,585
Ferrosilicon.....	long ton		5,586	328,886
Other ferro-alloys.....	long ton		603	133,548
Metals for making alloy steels (nickel, etc.).....	long tons		208	64,335
Scrap iron or steel, including old rails not intended for re-rolling.....	long ton		454,808	5,891,000
Scrap, made in works reporting.....	long ton	281,467		
Total metals.....		1,031,931	484,388	7,483,437
(b) Ores:—				
Crude iron ore:—				
Foreign.....	long ton		90,301	606,919
Manganiferous ore:—				
Foreign.....	long ton		3,769	74,764
Chrome, etc.:—				
Foreign.....	long ton		989	29,020
Total ores.....			95,059	710,703
(c) General materials:—				
Limestone—Canadian.....	short ton		46,216	83,639
Foreign.....	short ton		108,020	154,828
Fluorspar.....	short ton		10,299	137,547
Dolomite.....	short ton		19,495	63,178
Coke from Canadian coal.....	short ton		2,170	26,462
Coke made in Canada from imported coal.....	short ton		617	7,096
Imported coke.....	short ton		356	5,132
Anthracite coal.....	short ton		1,151	9,737
Bituminous coal.....	short ton		225	2,250
Charcoal.....	bushels		114,400	28,262
Carbon electrodes.....				131,651
Other materials.....				423,391
Total general materials.....				1,073,173
Total value of all metals, ores and general materials.....				9,267,313

Table 161.—Products of the Steel Ingots and Castings Industry in Canada, 1929

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	\$
Steel Ingots:—				
Basic open hearth.....	1,295,162	1,288,810	1,073	31,822
Electric.....	14,444	14,444		
Direct Steel Castings:—				
Basic.....	35,806	10,154	26,770	3,979,471
Bessemer.....	2,590	66	2,524	565,965
Electric.....	30,022	150	31,614	5,706,202
Total.....	1,378,024	1,313,624	61,981	10,283,460

*Production figures as given herein do not necessarily represent the total Canadian output; there may be also a small production in other industrial groups.

Table 162.—Materials used in the Rolled Iron and Steel Products Industry in Canada, 1929

Item	Companies' own make	Purchased materials	
		Quantity	Cost at mill
	Long tons	Long tons	\$
Steel, crude and semi-finished (ingots, blooms, billets, slabs).....	1,407,535	118,786	4,541,321
Rails, old or scrap.....		50,269	858,863
Iron muck and scrap bar.....	8,940	143	25,107
Iron and steel scrap.....	10,282	8,882	133,310
Axles, scrap.....		2,226	52,145
Other iron and steel.....	21,726		
All other materials.....			23,879
Total.....	1,448,483	180,306	5,684,625

Table 163.—Output of the Rolled Iron and Steel Products Industry in Canada, 1929

Products	Total tonnage made	Tonnage shipped to companies' own plants	Tonnage sold	Income from sales
	Long tons	Long tons	Long tons	\$
Blooms, billets and slabs, (except for forging).....	1,159,045	1,012,912	74,402	2,488,945
Rails.....	383,002	194	381,634	17,543,906
Structural shapes.....	31,304	839	31,106	1,552,835
Merchant bars, including rounds, squares, flats (6 in. and under), except flats for cold rolling and bars for reinforcing concrete.....	244,593	36,191	206,605	10,921,567
Bars for reinforcing concrete.....	59,515	3,700	60,738	3,240,317
Long angle splice bars, long fish plate bars, tie plate bars and all other long rail joint shape bars.....	83,552	83,552		
Spike rods, bolt and nut rods, horseshoe bars, and all other miscellaneous rolled (not forged) forms not elsewhere specified.....	17,800	18,583		
Wire rods, including chain rods.....	142,589	111,879	33,632	1,316,546
Finished rolled axles, and rolled blooms, billets and axle blanks for forging purposes only.....	27,938	4,500	18,352	1,408,477
Railway tie plates.....	60,191	24	59,323	3,168,851
Railway fish plates and angle splice bars.....	18,626		18,853	1,188,486
Forgings or iron and steel.....	9,278		9,257	919,491
Railway spikes.....	15,206	230	14,680	1,059,175
Washers.....	1,000	118	784	118,356
Scrap iron and steel.....	3,427	62	3,365	39,016
Other products.....				5,792,354
Total.....				50,758,322

Table 164.—World Production of Pig Iron, Steel Ingots and Castings, 1927-1929.

(In 1,000's of long tons = 2,240 lb. as reported by the Iron Trade Review.)

Country	Pig iron			Steel ingots and castings		
	1927	1928	1929	1927	1928	1929
United States.....	36,289	37,832	42,400	44,935	51,544	56,095
Canada.....	760	1,083	1,170	907	1,240	1,475
Great Britain.....	7,294	6,611	7,565	9,099	8,525	9,820
France.....	9,150	9,821	10,290	8,100	9,348	9,525
Belgium.....	3,692	3,843	4,035	3,645	3,872	4,105
Luxemburg.....	2,680	2,726	2,850	2,431	2,526	2,665
Italy.....	487	500	675	1,569	1,932	2,150
Spain.....	584	570	720	660	788	950
Sweden.....	448	431	500	491	567	675
Germany.....	12,893	11,615	13,300	16,050	14,285	16,200
Saar Territory.....	1,743	1,905	2,075	1,865	2,040	2,200
Austria.....	428	451	470	551	626	640
Czechoslovakia.....	1,241	1,515	1,600	1,845	2,000	2,150
Poland.....	607	673	710	1,226	1,414	1,420
Hungary.....	294	281	360	464	478	535
Russia.....	2,985	3,322	4,000	3,662	4,190	4,600
Japan.....	1,225	1,500	1,500	1,635	1,840	2,200
China.....	300	300	300	30	30	30
India.....	1,145	1,052	1,350	575	410	570
Australia.....	550	410	450	448	462	450
Miscellaneous.....	400	540	560	220	320	330
Total.....	85,195	86,981	96,880	100,408	108,437	118,785

Poland's figures include most of Upper Silesia. Japan's figures include Manchuria and Chosen.

Table 165.—Production of Pig Iron in Canada, by Provinces, 1924-1929

(Long tons)

Year	Nova Scotia	Ontario	Total
1924.....	177,078	415,971	593,049
1925.....	201,795	368,971	570,766
1926.....	250,238	507,079	757,317
1927.....	249,549	460,148	709,697
1928.....	302,756	734,971	1,037,727
1929.....	310,801	769,359	1,080,160

Table 166.—Production of Pig Iron in Canada, by Grades, 1924-1929

(Long tons)

Year	Basic	Foundry	Malleable	Total
1924.....	357,704	173,663	61,682	593,049
1925.....	409,590	101,968	59,208	570,766
1926.....	469,630	243,307	44,380	757,317
1927.....	523,701	145,787	40,209	709,697
1928.....	724,559	233,386	79,782	1,037,727
1929.....	770,478	221,644	88,038	1,080,160

Table 167.—Production of Pig Iron in Canada, by Months, 1926-1929

(Long tons)

Months	1926	1927	1928	1929
January.....	56,644	51,717	65,006	87,764
February.....	49,746	50,695	64,691	93,939
March.....	53,251	75,637	78,390	86,176
April.....	67,607	77,240	74,736	79,341
May.....	72,762	78,987	87,811	81,484
June.....	70,854	69,437	97,379	80,873
July.....	67,232	50,997	95,422	99,786
August.....	58,780	63,234	91,522	112,528
September.....	64,187	52,470	90,516	98,816
October.....	70,124	38,097	93,186	91,409
November.....	52,345	37,989	95,426	86,516
December*.....	73,785	63,197	103,642	72,548
Total.....	757,317	709,697	1,037,727	1,080,160

*Slight errors in monthly production figures have been compensated in December totals.

Table 168.—Production of Steel Ingots and Direct Steel Castings in Canada, by Kinds, 1924-1929

(Long tons)

Year	Steel ingots		Direct steel castings			Total steel ingots and castings
	Open hearth	Electric	Open hearth	Converter	Electric	
1924.....	634,954	.....	18,393	1,448	4,972	659,767
1925.....	734,277	.....	9,059	1,732	7,435	752,503
1926.....	744,103	.....	19,831	1,676	10,652	776,262
1927.....	868,440	134	17,569	2,191	19,611	907,945
1928.....	1,189,399	602	20,109	2,109	22,590	1,234,719
1929.....	1,295,162	14,444	35,806	2,590	30,022	1,378,024

Table 169.—Production of Steel Ingots and Castings in Canada, by Months, 1926-1929

(Long tons)

Month	1926	1927	1928	1929
January.....	68,536	58,551	84,295	116,260
February.....	53,157	55,620	98,820	117,445
March.....	58,765	107,381	118,258	137,158
April.....	79,936	109,107	112,780	122,102
May.....	89,513	96,711	117,655	126,372
June.....	81,277	59,940	116,530	119,505
July.....	64,847	55,250	82,807	129,827
August.....	45,674	77,479	88,677	120,282
September.....	58,837	54,250	99,888	99,000
October.....	63,542	56,371	108,987	115,674
November.....	54,311	80,730	108,463	93,648
December*.....	57,867	96,555	97,559	80,751
Total.....	776,262	907,945	1,234,719	1,378,024

*Slight errors in monthly production figures have been compensated in December totals.

MANGANESE

No manganese ore or pyrolusite has been produced in Canada since 1924 when 584 tons of ore valued at \$4,088 were produced in the province of New Brunswick. Deposits of manganese are also known to occur in Lunenburg county, Nova Scotia, and in British Columbia near the town of Kaslo.

The importance of manganese in the manufacture of iron and steel is steadily increasing. A large part of the consumption is in the manufacture of manganese-iron alloys (spiegeleisen and ferromanganese) for the manufacture of special steels.

The greatest deposits and the chief sources of manganese up to the present time are in Russia (Caucasus), Southern and Central India and East Central Brazil. It also occurs in commercial quantities in several countries of Europe, Canada, the United States, Mexico, and in Queensland, Australia.

Table 170.—Production of Manganese Ore in Canada, 1886-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1886.....	1,789	41,499	1900.....	30	1,800	1913.....	.....	.....
1887.....	1,245	43,658	1901.....	440	4,820	1914.....	28	1,120
1888.....	1,801	47,944	1902*.....	172	4,062	1915.....	201	9,360
1889.....	1,455	32,737	1903.....	91	2,775	1916.....	957	59,544
1890.....	1,338	32,550	1904.....	66	2,740	1917.....	158	14,836
1891.....	255	6,694	1905*.....	22	1,720	1918.....	440	6,230
1892.....	115	10,250	1906*.....	93	925	1919.....	661	14,159
1893.....	213	14,578	1907*.....	1	22	1920.....	649	11,029
1894.....	74	4,180	1908.....	.....	.....	1921.....	68	3,400
1895.....	125	8,464	1909.....	.....	.....	1922.....	73	2,044
1896*.....	124	3,975	1910.....	.....	.....	1923.....	200	1,400
1897*.....	15	1,166	1911.....	6	300	1924.....	584	4,088
1898.....	50	1,600	1912.....	75	1,875	1925-29.....	.....	.....
1899.....	1,581	20,004				Total.....	15,185	447,548

*Exports.

Table 171.—World Production of Manganese Ore, 1925-1929

(Short tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	928	143	1,690	263	.....
Gold Coast (exports).....	400,025	446,377	413,510	363,439	457,211
Northern Rhodesia.....	.....	.....	777	2,007	2,071
Union of South Africa.....	520	920	1,432	.....	10,306
Cyprus.....	.....	.....	18	.....	.....
Canada, (bog ore).....	.....	.....	.....	385	300
India.....	940,196	1,136,719	1,264,875	1,095,863	113,592
Australia.....	1,304	1,559	1,668	187	261
Total.....	1,342,880	1,585,920	1,680,000	1,456,000	1,568,000
FOREIGN COUNTRIES					
Austria(c).....	23,576	25,668	36,328	43,611	43,049
Bulgaria.....	623	540	8	.....	.....
Czechoslovakia.....	85,958	104,910	119,464	109,611	(a)
France.....	4,412	3,963	6,162	3,426	1,200
Germany.....	159	28	34	232	523
Greece.....	4,743	6,998	8,910	1,191	(a)
Hungary.....	6,924	10,920	19,040	24,435	20,992
Italy.....	16,517	15,444	10,753	11,325	10,528
Jugoslavia.....	2,994	1,371	2,173	2,932	4,955
Portugal.....	8	.....	541	.....	.....
Rumania.....	5,917	9,208	11,430	34,466	38,623
Russia (years ended Sept. 30)—	.....	.....	.....	.....	.....
Nikopol—	.....	.....	.....	.....	.....
Crude ore.....	416,308	949,710	1,013,792	.....	.....
Washed ore.....	193,534	527,256	520,453	809,552	1,344,000
Tchiaturi—(b)	.....	.....	.....	.....	.....
Crude ore.....	479,806	849,597	704,611	.....	.....
Washed ore.....	367,861	483,288	409,403	(d)	(d)
Urals—	.....	.....	.....	.....	.....
Crude ore.....	3,342	8,090	2,465	(a)	(a)
Spain.....	39,762	49,545	40,643	15,107	13,256
Sweden.....	12,060	16,819	18,544	17,406	25,780
Egypt.....	88,834	134,336	168,843	151,570	211,067
Morocco (French Zone).....	747	336	2,869	2,568	(a)
Tunis.....	1,906	1,576	2,267	2,800	125
Cuba (exports).....	26,181	27,167	143,028	95,982	(a)
Porto Rico (exports).....	4,695	1,587	1,819	1,706	(a)
Mexico.....	3,674	3,637	861	(a)	(a)
United States (e).....	110,123	51,809	50,110	52,483	67,624
Argentina.....	.....	.....	253	155	(a)
Brazil.....	359,896	282,149	266,564	352,547	323,327
Chile.....	12,193	(a)	8,475	10,132	3,378
China (exports).....	47,686	46,804	51,091	47,766	46,165
Japan.....	13,272	16,765	30,380	19,503	(a)
Dutch East Indies.....	11,050	13,177	16,494	26,954	(a)
Portuguese India.....	.....	.....	2,661	4,500	(a)
New Caledonia.....	.....	.....	143	(a)	(a)
Turkey.....	.....	.....	.....	56	166
Algeria (exports).....	496	636	.....	.....	.....
Total.....	1,792,000	2,688,000	1,904,000	1,792,000	2,464,000
World's Total.....	3,136,000	4,256,000	3,584,000	3,248,000	4,032,000

(a) Information not available.

(b) Includes 20,220 long tons in 1926-27 of concentrates produced from waste dumps.

(c) Manganese content of manganese ore and manganiferous iron ore.

(d) Included with nikopol.

(e) Shipments, excluding ore containing 10-35 per cent Mn. which is included with iron ore.

MERCURY

During 1926 a small amount of mercury was recovered from a property on the north shore of Kamloops lake, B.C. In 1895, 1896 and 1897 a small production was derived from the same district. Development work was done during 1929 on a Vancouver Island, Cinnabar Property.

Cinnabar, the principal ore of mercury is found in many countries of the world but the chief producing countries are Italy, Spain and United States in order of their importance. Mercury is used in the amalgamation of gold and silver and as a fulminate in the making of detonators. It also enters largely into the manufacture of drugs, and vermilion (mercuric sulphide) the well-known red pigment. Its increased use in the United States is due to the greater consumption in electrical apparatus such as radios, meters, and storage batteries.

Table 172.—Production of Mercury in Canada, 1895-1929

Year	Flasks	Price per flask	Value
		\$	\$
1895.....	71	33.00	2,343
1896.....	58	33.44	1,940
1897.....	9	36.00	324
1898-1929.....			

Table 173.—Imports into Canada of Mercury, 1924-1929

Year	Pounds	Value
		\$
1924.....	85,459	60,675
1925.....	146,435	118,697
1926.....	100,492	84,910
1927.....	124,099	160,330
1928.....	199,603	269,746
1929.....	346,701	478,048

Table 174.—Monthly Average Price of Mercury, 1927-1929

(At New York, per flask of 76 pounds) *

(From Engineering and Mining World)

Month	1927	1928	1929
	\$	\$	\$
January.....	101.500	123.620	119.481
February.....	101.727	121.370	119.818
March.....	110.259	122.557	121.904
April.....	123.250	123.740	122.000
May.....	123.900	123.173	121.154
June.....	118.095	122.423	120.500
July.....	119.880	121.260	121.654
August.....	119.111	124.500	125.111
September.....	119.640	128.000	124.542
October.....	126.200	125.923	124.298
November.....	127.708	123.000	123.323
December.....	126.933	122.500	121.959
Average.....	118.159	123.506	122.145

*Prior to June, 1927, the unit was 75 pound flask.

Table 175.—World Production of Mercury, 1925-1929

(Pounds)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada.....		375			
New Zealand.....			1,568		
FOREIGN COUNTRIES					
Austria.....	13,514	15,598	18,739	14,550	10,041
Czechoslovakia.....	161,1854	181,300	121,799	158,576	(a)
Italy.....	4,042,340	4,124,848	4,400,426	4,383,495	4,321,600
Roumania.....	7,180	4,467	7,848		
Russia (years ended Sept. 30).....	21,798	279,423	163,230	224,210	(a)
Spain.....	2,816,046	3,514,538	5,496,121	4,839,413	(a)
Algeria.....	9,918	48,500	5,952		22
Mexico.....	85,365	100,125	178,828	192,726	182,181
United States.....	688,050	573,150	845,700	1,358,120	1,799,850
Turkey.....	138,000	138,000		6,600	17,925
Japan.....				1,017	(a)
China (exports).....	7,180	4,467			
World's Total.....	8,000,000	9,000,000	11,000,000	11,000,000	(a)

(a) Information not available.

MOLYBDENUM

Molybdenite deposits are known to occur in Nova Scotia, Quebec, Ontario, Manitoba and British Columbia, but the principal production has come from the Moss Mine near Quyon in Pontiac county, Quebec.

In 1926 the Moss mine at Quyon, Quebec, produced 25,168 pounds of molybdenum concentrates containing 20,943 pounds of molybdenum sulphide which, at 50 cents per pound, was worth \$10,472.

The war stimulated the demand for molybdenum ores to an appreciable extent but with the cessation of hostilities, the producers were left with considerable stocks on hand for which there was no immediate market, owing to the then limited uses of the metal. The ore produced was mostly low-grade material carrying less than 2 per cent MoS_2 , some rock assayed from 2 to 15 per cent MoS_2 , and some higher grade hand-picked material was also produced.

Molybdenum is chiefly used in the manufacture of molybdenum steel for use in automotive construction. The principal producing countries during the last three years were the United States, Norway, Australia and Canada.

In Quebec, one property produced molybdenite during 1929; while two others, one in Quebec and one in British Columbia, were under development.

Table 176.—Production of Molybdenite in Canada, 1902-1929

Year	Ores mined	Ores treated	Ores and concentrates shipped		MoS ₂ content of shipments	MoS ₂ production (probable recovery)	
	Tons	Tons	Tons	Value (a) \$	Pounds	Pounds	Value (b) \$
1902.....	3		3.3	400	(c)	(c)	(c)
1903.....	600		85.0	1,275	(c)	(c)	(c)
1904-1913.....							
1914.....	166		16.5	2,063	3,814	3,814	2,063
1915.....	2,242	216	39.0	28,920	29,210	29,210	28,450
1916.....	13,522	9,100	610.0	188,316	156,461	156,461	156,461
1917.....	26,871	22,605	1,554.3	320,006	330,316	288,705	288,705
1918.....	34,030	33,935	461.3	428,807	378,482	378,029	434,733
1919.....	7,280	6,783	46.0	69,203	83,002	83,002	69,203
1920-1923.....							
1924.....	700	668	10.0	9,370	18,739	18,739	9,307
1925.....	3,000	2,779	15.3	11,176	22,350	22,350	11,176
1926.....	4,186	4,490	12.6	10,472	20,943	20,943	10,472
1927.....							
1928.....							
1929.....	9,100	2,900	9.5	6,400	16,150	16,150	6,400

(a) Value as given by the operators.

(b) Estimated at the average market value of molybdenite.

(c) No figures available.

Table 177.—World Production of Molybdenum, 1925-1929

(In 1,000 pounds molybdenum content)

(From *The Mineral Industry*, 1929)

Country	1925	1926	1927	1928	1929
Australia, N.S.W.	7	1			
Australia, Queensland	4		1	2	
Australia, Victoria	39	48			
Canada	17	12			14
Japan					
Korea		44			
Norway	159	154	175	255	341
Spain		7			
Sweden					
United States	1,154	1,371	2,150	3,410	4,030
All other countries		45	19	51	
Total	1,380	1,682	2,345	3,718	4,385

TIN

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important perhaps being the discovery of cassiterite, near New Ross, Lunenburg county, N.S. Reports on this occurrence may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines for 1907, 1908, 1910, 1911 and 1912.

Cassiterite occurs in a few scattered crystals in pegmatite dykes in the drainage basin of McDougal creek, Lardeau division, B.C., and it has been found also in black sands in the Atlin district, B.C., and in the alluvial sands of Dublin gulch, Mayo district, Yukon.

Tin is also found in Sullivan mine ore which is primarily lead and zinc. It has been separated by the Consolidated Mining and Smelting Company, Limited, but up to the present, the work has been only experimental and there has been no commercial production of the metal from this source.

Ores of tin were formerly imported from South America and reduced in Canada by the Electro Tin Products Company at Brantford, Ontario. The plant, which consisted of roasting furnaces, electric smelting and slag-cleaning furnaces, was dismantled some years ago when competition of European smelters treating the easily-reducible tin concentrates from the Malay States, made the operation of the Canadian plant (and several in the United States) unprofitable.

Tin bearing pegmatites of the Winnipeg river area, in Manitoba, received considerable attention during 1929; an appreciable amount of exploratory work was accomplished on the more promising of these occurrences.

Table 178.—Imports into Canada of Tin, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		\$		\$		\$
Tin in blocks, pigs and bars	4,833,800	3,066,082	5,358,700	2,822,413	5,714,500	2,670,819
Tin foil	154,622	77,914	102,388	61,127	102,152	55,092
Strip waste	4,000	66	2,000	40		
Collapsible tubes		82,179		44,655		49,841
Dairy tin		69,279		74,400		81,238
Tinware, etc. (a)		638,405		838,204		870,961
Tin cans and containers		673,173		518,047		644,075
Bichloride of tin or tin crystals	415,705	147,323	737,819	229,985	965,236	282,329
Total		4,754,421		4,588,871		4,654,355

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin, n.e.s.

Table 179.—World Production of Tin

(In terms of metal)
(short tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	2,620	2,606	2,904	3,902	3,664
Nigeria.....	7,007	8,307	9,023	10,228	12,022
Southern Rhodesia.....	19	16	26	8	15
South West Africa.....	151	147	165	180	192
Swaziland.....	217	149	119	146	146
Tanganyika Territory.....	8	20	40	41	16
Uganda.....			90	208	252
Union of South Africa.....	1,285	1,244	1,285	1,399	1,364
India.....	1,810	2,782	2,741	2,180	2,967
Federated Malay States (Exports).....	51,437	51,461	58,440	69,367	75,086
Unfederated Malay States.....	2,402	1,990	2,358	3,002	2,605
Straits Settlements.....	7	2	76	50	(a)
Australia.....	3,378	3,203	3,521	3,237	2,508
Total.....	70,336	71,904	80,640	93,184	100,800
FOREIGN COUNTRIES					
Portuguese East Africa.....	(a)	9			
Czechoslovakia.....	20	24	36	29	(a)
France.....			28	(a)	(a)
Portugal.....	672	896	784	784	560
Spain.....	49	53	163	241	(a)
Belgian Congo.....	672	1,406	977	878	1,095
French Morocco.....		6	6	11	(a)
Mexico.....	1	2		46	6
United States.....	13	8	27	28	39
Argentina.....	1	3	13		(a)
Bolivia (exports).....	36,091	33,667	40,105	46,379	51,897
China (exports of ingots).....	9,520	7,616	6,968	7,876	7,591
Dutch East Indies.....	36,679	36,967	38,006	39,136	39,984
French Indo China.....	652	664	783	893	839
Japan (smelter).....	431	601	749	821	
Siam.....	9,029	8,385	8,494	8,451	11,779
Total.....	94,080	90,720	97,440	105,280	115,360
World Total.....	164,640	162,400	178,080	198,240	216,160

(a) Information not available.

TUNGSTEN

Tungsten ores are found in several very widely separated districts in the Dominion, notably, in the provinces of Nova Scotia, New Brunswick, Manitoba and British Columbia. Deposits in Nova Scotia and New Brunswick are the most important. In 1929 some intensive prospecting was done at the Indian Path mine, Lunenburg county, Nova Scotia.

The only important productions ⁽¹⁾ of tungsten ore in Canada reported, are the following:

In 1912 there was a shipment of 14 tons of concentrates produced by the Scheelite Mines, Ltd., of Moose River, N.S.

In 1917 a small test shipment of a few hundred pounds was made from Halifax county, N.S., and another from Dublin gulch, Mayo district, Y.T., amounting in all to 580 pounds, running 69.41 per cent WO₃ and netting \$234.

The production in 1918 amounted to 13½ tons valued at \$11,700 and with a metallic content of 19,915 pounds of WO₃. This production consisted of 11 tons of concentrates shipped to New York by the Acadia Tungsten Mines, Limited, operating at Burnt Hill, N.B., and a few small consignments to the Mines Branch testing plant, Ottawa, from Nova Scotia, Manitoba, and the Mayo district, Yukon.

China is the world's greatest producer of tungsten and in 1929 the production from that country amounted to about 50 per cent of the world's output of tungsten ores. Practically the entire Chinese output was exported to Germany, the United States, Great Britain, Belgium, France and other countries. One of the recent and more important uses of tungsten is in the making of tungsten-carbide machine tools.

(1) Mines Branch report, 1920.

Table 180.—World Production of Tungsten (a) 1925-1929

(Metric tons; 60 per cent WO₃ concentrates)

(The Mineral Industry, 1929)

Country	1925	1926	1927	1928	1929
NORTH AMERICA—					
United States.....	1,080	1,254	1,056	1,096	2,300
Mexico.....	*25	*25	*25	*25	*45
SOUTH AMERICA—					
Argentina.....	4	*11	*10	24	*120
Bolivia.....	75	109	*79	29	*585
Peru.....	5	18	.....	.....	*100
EUROPE—					
England.....	2	20	*35	96	*135
France.....	150	*110	*100	5	14
Portugal.....	207	240	*179	500	*700
Saxony-Bohemia.....	221	*140	*50	80	*120
Spain.....	73	*148	*197	158	350
ASIA—					
Burma.....	850	1,900	1,277	1,780	*2,200
China.....	7,000	8,000	*5,666	8,283	*6,500
Federated Malay States.....	171	163	24	30	25
Unfederated Malay States.....	251	234	*170	139	150
French Indo-China.....	189	170	*200	211	238
Japan and colonies.....	15	18	45	165	*283
Siam.....	10	10	8	*20	*35
AUSTRALASIA—					
New South Wales.....	7	.....	.....	.....	*68
New Zealand.....	2	9	7	6	*25
Northern Territory.....	.....	.....	.....	.....	.....
Queensland.....	5	1	3	29	*45
Tasmania.....	207	91	*176	209	*380
Total.....	10,549	12,671	9,307	12,000	13,500

(a) Statistics reported by F. L. Hess and L. M. Jones of the United States Bureau of Mines and by foreign governments.

*Preliminary estimate.

CHAPTER SIX

The Non-Ferrous Smelting and Refining Industry in Canada

Co-incident with the expansion in the mining of ores bearing non-ferrous metals, there has been a notable increase in the smelting and refining of such ores in Canada. Abundant water power, advantageously distributed throughout the Dominion, has made possible the generation of electric energy at such a low cost that the use of electrochemical or electrothermic processes has been adopted in many new fields. Among these may be noted the smelting of bauxite ores and the production of aluminium in various forms in Quebec, the refining of nickel and copper in central Ontario, the manufacture of electrolytic lead and zinc in British Columbia. Electric furnaces are also used in the manufacture of abrasives and ferro-alloys, and, in a small way, in the treatment of iron and steel.

As a source of power, electric energy is being used to an increasing extent in the mining and milling fields and important economies in operation are being effected.

In the treatment of ores, the mining and milling are so closely associated, that it is impossible to make a separation of the statistics in these two operations. There is less difficulty in drawing a line between mining and milling on the one hand, and smelting and refining on the other. This chapter is devoted to a consideration of the smelting and refining industry in Canada treating the ores of the non-ferrous metals.

The 10 plants operated by the 7 companies included in this group in 1929 were as follows:— 1 plant at Arvida and 1 plant at Shawinigan Falls, Quebec, both operated by the Aluminum Company of Canada, Limited; the smelter at Rouyn, Quebec, operated by the Horne Copper Corporation; the smelter at Coniston, Ontario, the smelter at Copper Cliff and the refinery at Port Colborne, Ontario, operated by the International Nickel Company of Canada, Limited; the smelter and hydrometallurgical works of the Deloro Smelting and Refining Company at Deloro, Ontario; the smelter of the Kingdon Mining, Smelting and Manufacturing Company Limited, near Galetta, Ontario; the smelter, lead refinery, zinc refinery, precious metals refinery and copper refinery of the Consolidated Mining and Smelting Company at Tadanac, near Trail, B.C.; and the smelter of the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox, B.C.

In Quebec the Aluminum Company of Canada operated their new plant at Arvida steadily throughout the year on the production of aluminium. Smelting of alumina imported from the United States has been carried on at Shawinigan Falls for many years and the construction of the new plant at Arvida by the same company places the province of Quebec in an enviable position as a producer of aluminium metal in its various forms.

In the Horne Copper Corporation, Quebec has another industrial enterprise that has attracted much attention since its formation. Smelter construction, which was commenced early in 1926, was completed and the smelter put in operation on December 16, 1927; treatment of customs ores from the mines of the district are adding to the smelter output.

Ontario has 4 smelters and 1 refinery in operation. The International Nickel Company Limited, operates a smelter at Coniston, Ontario, producing a matte that is shipped to the refinery operated by the same company at Clydach, Wales, where nickel metal, copper sulphate, gold, silver, and the metals of the platinum group are produced. The International Nickel Company also mines and smelts nickel-copper ore at Copper Cliff, Ontario, producing a nickel-copper matte, part of which is shipped to Huntington, West Virginia, U.S.A., where it is made into the alloy known as monel metal, and the remainder is shipped to the company's refinery at Port Colborne, Ontario, where refined and electrolytic nickel, converter copper and sponge platinum are made. The Deloro Smelting and Refining Company of Deloro, Ontario, treats ores from the districts of Cobalt, South Lorrain and Gowganda and produces refined silver, cobalt metal, cobalt oxides, nickel oxides and salts, white arsenic, bismuth metal, various insec-

ticides and stellite, an alloy of cobalt, chromium and tungsten used chiefly as a metal cutting tool. The Kingdon Mining, Smelting and Manufacturing Company operates a lead mine, mill and small smelter or Scotch hearth at Galetta, Ontario. As the general statistics given by the last named company were not separated by departments and as mining and milling predominate in this enterprise, data on capital investment, salaries, wages, etc., for this property have been combined with the statistics on silver-lead-zinc mining, but the value of the smelter production has been included with the figures for the other smelters. An estimate was made of the value of the ores smelted and this figure was included in the totals for the silver-lead-zinc mining section, so that the proper adjustments have been made to ensure the comprehensive treatment of mine and smelter statistics.

British Columbia is the only other province in the Dominion in which there are non-ferrous smelting plants in operation. In this province there are 2, one operated by the Consolidated Mining and Smelting Company at Trail, and the other by the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox. The smelter at Trail is the largest non-ferrous metallurgical works in the British Empire. There facilities are provided for the treatment of lead ore and concentrates, zinc ore and concentrates, copper and gold ore and concentrates. This smelter purchases practically all the smelting ore mined in southern British Columbia but its main source of supply is from the famous Sullivan zinc-lead mine at Kimberley, B.C., which mine is owned by the company. The products are, fine gold, fine silver, refined copper, refined lead, refined zinc, cadmium, copper sulphate, and small amounts of platinum and palladium. Each year new demands have been made on the capacity of the smelter, which have been met so readily that very little smelting material within reasonable hauling distance is now sent elsewhere. This company also operates a concentrator to which mining companies that have no mill may send their ore. In the northern part of the province, at Anyox, there is the copper smelter of the Granby Consolidated Mining, Smelting and Power Company Limited, which treats the ore from its own mines, the Hidden Creek and Bonanza, some custom work is also done. The copper matte made at Anyox was shipped to the United States for refining.

More important events in this and associated Canadian industries during 1929 include the commencement of construction on a new and much larger smelter at Copper Cliff, Ontario, by the International Nickel Company; the erection of an electrolytic copper refinery at the same place by the Ontario Refining Company, and the beginning of work on the new triple superphosphate plant of the Consolidated Mining and Smelting Company at Trail, British Columbia.

Table 181.—Ores, Concentrates and Residues Smelted and Value of Smelter and Refinery Products in the Non-Ferrous Smelting and Refining Industry, 1928 and 1929

	1928	1929
	\$	\$
Materials used—		
Ores, concentrates, residues, etc. (estimated value).....	33,261,225	41,416,446
Products made—		
Gold, silver, blister copper, refined copper, lead, zinc, nickel, nickel-copper matte, nickel oxide, nickel salts, cobalt, cobalt oxide, speiss residues, aluminium, base bullion, cadmium and bismuth.....	94,341,702	109,854,468

Table 182.—Capital Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Lands, buildings, plants, machinery and tools.....	70,356,321	94,587,504
Materials on hand, supplies, finished products, ore in storage.....	22,464,571	21,922,933
Cash, trading and operating accounts, bills receivable.....	27,214,850	30,188,648
Total	120,035,742	146,699,085

Table 183.—Employees, Salaries and Wages in the Non-Ferrous Smelting and Refining Industry in Canada, 1928 and 1929

	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
			\$			\$
Salaried Employees—						
Total.....	612	73	1,635,580	Male 621 Female 63		1,753,840
Wage-Earners—						
January.....	6,188	29	10,593,158	6,908	12,018,553	
February.....	6,289	29		6,974		
March.....	6,652	29		6,875		
April.....	6,478	29		7,046		
May.....	6,805	29		7,263		
June.....	6,981	29		7,446		
July.....	6,874	29		7,717		
August.....	6,893	30		7,637		
September.....	6,917	41		7,475		
October.....	6,841	43		7,931		
November.....	6,842	41		8,005		
December.....	6,801	41		7,777		
*Average.....	6,804	37	.....	7,435	.....	.....
Total.....	7,416	110	12,228,738	8,119		13,772,393

*See note page 37.

CHAPTER SEVEN

THE COAL MINING, COKE, NATURAL GAS, PEAT AND PETROLEUM INDUSTRIES
(Fuels) IN CANADA

The Coal Mining Industry in Canada.....	
1. General Review.....	
2. Commodity Statistics on Coal—including Tables on Output, Disposition, Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption and World Output.....	
The Coke and Gas Industry in Canada.....	
The Peat Industry in Canada.....	
The Petroleum Industry in Canada.....	
1. Production of Crude Petroleum.....	
2. Production of Petroleum Products.....	

NOTE.—In order to correlate data regarding fuels in Canada, this chapter has been prepared to include statistics of the coal, natural gas, peat and petroleum industries. This survey presents information in detail regarding these industries as a whole, dealing principally with the mineral industry although supplementary data are shown for closely allied manufacturing operations.

THE COAL MINING INDUSTRY

Canada's coal output of 17,496,557 tons in 1929 has only been exceeded by the record production of 1928. The 1929 output was 0.4 per cent lower than the total for the preceding year but 11.8 per cent higher than the average for the past five years. An increase of 4.6 per cent was recorded in the Nova Scotia output, 5.3 per cent in New Brunswick; and 23.0 per cent in Saskatchewan. Alberta's production was 2.5 per cent lower than the high mark for the province of 7,336,330 tons which was set up in 1928. British Columbia's output of 2,490,378 tons showed a decrease of 11.2 per cent.

Nova Scotia, New Brunswick, British Columbia, and the Yukon produce only bituminous coal; Saskatchewan mines yield lignite only; Alberta produces bituminous, sub-bituminous and lignite, and formerly also mined some anthracite but the only anthracite mine has been closed down since 1923.

Railroads in Canada consumed 5.2 million tons of Canadian coal in 1929; this tonnage represented 32.9 per cent of the total shipments from the mines. Quebec provided the largest market for Canadian coal during 1929. Exclusive of coal for the use of railroads, 2,372,541 tons of Canadian coal were shipped to Quebec points.

Lack of orders, mine disability, car shortage, absenteeism and other miscellaneous causes were responsible for the loss in output of 5,076,019 tons by the Canadian coal mines operating in 1929. It is also estimated that labour disputes at the coal mines in 1929, involving 3,045 men with a consequent loss in working time of 15,805 man-days, were the cause of a further loss of 38,880 tons.

Exports of Canadian coal in 1929 amounted to 842,972 tons, a decrease of 2.43 per cent from the 1928 total of 863,941 tons. Coal cleared through Nova Scotia and British Columbia ports accounted for 96 per cent of the Canadian exports. The United States and Newfoundland provided the principal markets for Canada's external shipments of coal.

The imports of anthracite, bituminous and lignite coal into Canada in 1929 were recorded at 18,619,300 tons as compared with 17,714,296 tons in the preceding year. Receipts from Great Britain consisted of 729,458 tons of anthracite and 115,368 tons of bituminous, making a total of 844,826 tons, an increase of 25.98 per cent over the 1928 imports of 670,612 tons. The principal supply of coal imported into Canada came from the United States, this tonnage was made up of 14,469,831 tons of bituminous, 3,173,043 tons of anthracite and 14,108 tons of lignite.

Shipments of anthracite coal from Russia to Canadian points commenced in December, 1928, and during the calendar year 1929, the tonnage received assumed important proportions amounting to 117,304 tons. Small quantities of coal were also received from Newfoundland and Japan.

The coal mining industry furnished employment to 29,739 employees during 1929. In Eastern Canada steady employment was afforded the 13,929 men working in or about the coal mines; in Western Canada the usual number seasonal decline was apparent. Salaries and wages paid in this industry amounted to \$42,376,378 as against \$43,320,811 in 1928. There were 28,227 wage-earners working in the coal mines of Canada in 1929; of these 6,323 worked on the surface and 21,904 underground. An average of 275 days' work was furnished surface men while underground men worked 246 days.

Records for the industry show 7,117,692 man-days work done during the year and from this total it has been computed that the average daily earning power per man was \$5.49. Calculated on the same basis, the average in 1928 was \$5.57 and in 1927 it was \$5.03.

Capital employed by the companies operating in the coal mining industry in Canada in 1929 was \$141,766,727. The value of fuel used in the operation of Canadian coal mines in 1929 was \$3,087,105 and consisted principally of bituminous, sub-bituminous and lignite coal, although small quantities of gasoline, kerosene and wood were also used. Electricity purchased amounted to 40,326,458 k.w.h. valued at \$570,250, in addition to which 108,944,704 k.w.h. were generated by the operating companies for their own use. A further quantity of 6,554,222 k.w.h. was produced and sold for use apart from coal mining operations.

Canadian domestic and industrial consumers used large quantities of coke, manufactured and natural gas, fuel oil and electricity, in addition to the 35.27 million tons of coal consumed in 1929. Coke manufactured in 1929 amounted to 2,712,337 tons; sales totalled 1,183,762 tons; exports were 25,208 tons, while imports of coke were recorded to 1,226,853 tons. Coke made available for consumption during the year was 3,913,982 tons. The coal equivalent of the coke imported was 1,887,464 tons. Canadian coal used at the collieries for the manufacture of coke amounted to 115,482 tons in 1929.

Manufactured gas is used extensively for household purposes and in 1929 the sales of gas in Canada totalled 17,638,942 thousand cubic feet.

Natural gas consumed for domestic purposes amounted to approximately 16,000,000 thousand cubic feet; industrial users utilized 12,000,000 thousand cubic feet. It is calculated that the domestic consumption was sufficient to displace 640,000 tons of coal.

The Canadian consumption of fuel oil for industrial and domestic purposes continues to increase. In 1929 the total quantity of fuel oil available for consumption in Canada was 514,567,878 gallons as compared with 435,327,021 gallons in the preceding year. The Dominion Fuel Board survey of domestic fuel consumption in 1928 showed a total distribution of 34,263,000 gallons of fuel oil for domestic heating in the Canadian acute fuel area, Ontario and Quebec. This quantity indicates a possible coal displacement of 273,000 tons.

Table 184.—Capital Employed in the Coal Mines of Canada, by Provinces, as at December 15, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	47,063,302	3,184,255	6,999,893	57,247,450	46,662,239	4,560,401	4,582,887	55,805,527
New Brunswick...	1,432,033	24,687	188,584	1,645,304	1,452,893	24,243	179,527	1,656,663
Saskatchewan....	3,746,791	61,512	162,999	3,971,302	3,749,528	83,339	163,851	3,996,718
Alberta.....	47,006,422	1,113,144	8,218,333	56,337,899	47,031,532	1,072,587	7,968,965	56,073,084
British Columbia..	24,593,123	703,161	2,134,586	27,430,870	21,262,840	663,795	2,105,100	21,031,735
Yukon.....	203,000	.....	.....	203,000	203,000	.....	.....	203,000
Canada.....	124,044,671	5,086,759	17,704,395	146,835,825	120,362,032	6,404,365	15,000,330	141,766,727

Table 185.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces, 1929

Province	Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Under-ground				
						\$	\$	\$
Nova Scotia.....	513	51	2,235	10,525	13,324	1,061,401	18,785,513	19,846,914
New Brunswick.....	25	2	126	452	605	51,312	542,469	593,781
Saskatchewan.....	29	2	127	434	592	70,304	530,391	600,695
Alberta.....	578	35	2,449	7,085	10,147	1,476,730	13,128,467	14,605,197
British Columbia.....	257	20	1,385	3,406	5,068	634,202	6,094,389	6,728,591
Yukon.....			1	2	3		1,200	1,200
Canada.....	1,402	110	6,323	21,904	29,739	3,293,949	39,082,429	42,376,378

Table 186.—Wage-Earners in the Coal Mines of Canada by Months and by Provinces, 1928 and 1929

Month and year	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
January.....1928	13,498	587	726	11,512	5,330		31,653
.....1929	12,906	674	711	11,174	4,995		30,460
February.....1928	13,444	573	603	10,245	5,231		30,096
.....1929	12,665	698	691	11,098	4,953		30,105
March.....1928	13,501	565	521	9,174	5,147		28,908
.....1929	12,400	666	592	9,212	5,105		27,975
April.....1928	13,504	529	333	7,669	4,800		26,835
.....1929	12,578	560	413	7,610	4,946		26,107
May.....1928	13,617	523	307	6,837	4,879		26,163
.....1929	12,700	533	373	7,230	4,365		25,201
June.....1928	13,528	532	298	7,200	4,983	4	26,545
.....1929	12,824	533	368	7,707	4,285	3	25,720
July.....1928	13,433	527	304	7,698	4,958	4	26,924
.....1929	12,629	530	375	8,053	4,370	3	25,960
August.....1928	13,271	516	318	8,633	4,892	4	27,634
.....1929	12,559	544	391	8,689	4,445	3	26,631
September.....1928	12,950	549	457	9,376	5,042	4	28,378
.....1929	12,850	515	614	9,902	4,871	3	28,755
October.....1928	12,913	843	738	10,412	5,269		30,175
.....1929	12,936	538	732	10,989	5,041		30,236
November.....1928	13,162	612	773	11,181	5,047		30,775
.....1929	12,989	558	737	11,239	5,047		30,570
December.....1928	13,172	661	719	11,417	4,943		30,912
.....1929	13,082	583	734	11,507	5,067		30,973
Average.....1928	13,333	585	509	9,280	5,043	4	28,754
.....1929	12,760	578	561	9,534	4,791	3	28,227

Table 187.—Wage-Earners Employed, Days' Work Done by Months in the Coal Mines of Canada, 1929, with Comparative Totals for 1928

Month	Number of wage-earners			Days' work done		
	Surface	Under-ground	Total	Surface	Under-ground	Total
January.....	6,569	23,891	30,460	154,782	489,456	644,238
February.....	6,543	23,562	30,105	149,289	485,257	634,546
March.....	6,223	21,752	27,975	136,384	417,539	553,923
April.....	5,967	20,140	26,107	135,720	415,070	550,790
May.....	5,832	19,369	25,201	136,847	424,719	561,566
June.....	5,943	19,777	25,720	137,669	422,374	559,043
July.....	6,037	19,923	25,960	136,086	412,598	548,684
August.....	6,229	20,402	26,631	147,470	439,168	586,638
September.....	6,486	22,269	28,755	147,727	447,020	594,747
October.....	6,705	23,531	30,236	158,323	500,444	658,767
November.....	6,623	23,947	30,570	147,255	470,562	617,817
December.....	6,704	24,269	30,973	148,724	457,209	605,933
Total for 1929.....				1,733,276	5,381,416	7,117,692
Total for 1928.....				1,838,183	5,358,827	7,167,010

Table 188.—Wage-Earners Employed in the Coal Mines of Canada, by Classes and by Provinces, 1929, with Comparative Totals for 1928

Classification	Province						Canada		
	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Surface	Under-ground	Total
SURFACE—									
Administration.....	77	14	10	92	27		197	23	220
Foremen and clerks.....	157	15	18	217	110		501	16	517
Screenmen and loaders.....	648	34	35	770	175		1,562	100	1,662
UNDERGROUND—									
Officials.....	504	10	11	331	149		6	999	1,005
Hand cutters and helpers.....	1,340	380	253	2,499	1,434	1	2	5,905	5,907
Machine cutters.....	1,634	4	18	414	81			2,151	2,151
Machine loaders and helpers.....	1,229	13	46	1,598	170			3,056	3,056
Horse haulage employees.....	666	1	61	649	388	1	41	1,725	1,766
Mechanical haulage employees.....	1,605	14	11	391	338		80	2,279	2,359
Ventilation employees.....	299		1	99	39		4	434	438
Roadmakers.....	290	5	16	184	83		10	568	578
Timbermen.....	835	15	7	298	196		19	1,332	1,351
Pumpmen.....	112	2	8	46	32		8	192	200
MISCELLANEOUS—									
Enginemmen.....	202	10	10	165	76		446	17	463
Firemen.....	147	4	14	118	58		340	1	341
Machinists.....	192	1	3	86	68		335	15	350
Carpenters and masons.....	108	8	7	77	90		289	1	290
Other mechanics.....	273			111	117		288	221	509
All other white employees.....	2,442	46	26	1,389	754	1	1,974	2,684	4,658
Japanese.....					53		1	52	53
Chinese.....					341		220	121	341
Indians.....					12			12	12
Total for 1929.....	12,760	578	561	9,534	4,791	3	6,323	21,904	28,227
Total for 1928.....	13,333	585	509	9,289	5,043	4	6,522	22,232	28,754

Table 189.—Output of Coal from Canadian Mines, 1785-1929

Year	Short tons	Value	Average per ton	Year	Short tons	Value	Average per ton
		\$	\$			\$	\$
1785-1866.....	2,863,826	4,905,462	1.71	1898.....	4,173,108	8,224,288	1.97
1867.....	631,320	1,056,725	1.67	1899.....	4,925,051	10,283,497	2.09
1868.....	623,392	1,073,061	1.72	1900.....	5,777,319	13,742,178	2.38
1869.....	687,825	1,155,282	1.68	1901.....	6,486,325	12,699,243	1.96
1870.....	752,635	1,243,139	1.65	1902.....	7,466,681	15,210,877	2.04
1871.....	3,033,152	5,073,331	1.67	1903.....	7,960,364	15,942,833	2.00
1872.....				1904.....	8,254,595	16,592,231	2.01
1873.....				1905.....	8,667,948	17,520,263	2.02
1874.....				1906.....	9,762,601	19,732,019	2.02
1875.....	1,063,742	1,763,423	1.66	1907.....	10,511,426	24,381,842	2.32
1876.....	1,039,974	1,747,016	1.68	1908.....	10,886,311	25,194,573	2.31
1877.....	994,762	1,729,546	1.74	1909.....	10,501,475	24,781,236	2.36
1878.....	1,036,670	1,794,415	1.73	1910.....	12,909,152	30,909,779	2.39
1879.....	1,089,744	1,941,285	1.78	1911.....	11,323,388	26,467,646	2.34
1880.....	1,126,497	2,050,639	1.82	1912.....	14,512,829	36,019,044	2.48
1881.....	1,482,714	2,657,194	1.79	1913.....	15,012,178	37,334,940	2.49
1882.....	1,537,106	2,688,821	1.75	1914.....	13,637,529	33,471,801	2.45
1883.....	1,848,148	3,248,446	1.76	1915.....	13,267,023	32,111,182	2.42
1884.....	1,818,684	3,109,635	1.71	1916.....	14,483,395	38,817,481	2.68
1885.....	1,984,959	3,593,831	1.81	1917.....	14,046,759	43,199,831	3.08
1886.....	1,920,977	3,417,807	1.78	1918.....	14,977,926	55,192,896	3.68
1887.....	2,116,653	3,739,840	1.77	1919*	13,919,096	55,622,670	3.99
1888.....	2,429,330	4,388,206	1.81	1920*	16,946,764	82,496,538	4.86
1889.....	2,602,552	4,674,140	1.80	1921*	15,057,493	72,451,656	4.81
1890.....	2,658,303	4,894,287	1.84	1922*	15,157,431	65,518,497	4.32
1891.....	3,084,682	5,676,247	1.84	1923*	16,990,571	72,058,986	4.24
1892.....	3,577,749	7,019,425	1.96	1924*	13,638,197	53,593,988	3.93
1893.....	3,287,745	6,363,757	1.94	1925*	13,134,968	49,261,951	3.75
1894.....	3,783,499	7,359,080	1.95	1926*	16,478,131	59,875,094	3.63
1895.....	3,847,070	7,429,468	1.93	1927*	17,426,861	61,867,463	3.55
1896.....	3,478,344	6,739,153	1.94	1928*	17,564,293	63,757,833	3.66
1897.....	3,745,716	7,226,462	1.93	1929*	17,496,557	63,065,170	3.60
1897.....	3,786,107	7,303,597	1.93				
				Total.....	457,287,622	1,344,462,246	

*For the years 1919-1929 the tonnage shown is the total output from all mines; for previous years the tonnage shown includes only sales, colliery consumption, and coal used by the operators.

Table 190.—Output and Value of Coal in Canada by Kinds and by Provinces, 1928 and 1929

(Short tons)

Province	1928			1929		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
			\$			\$
NOVA SCOTIA (Bituminous).....	40	6,743,504	27,427,556	36	7,056,133	28,071,956
NEW BRUNSWICK (Bituminous).....	15	207,738	869,104	11	218,706	909,169
SASKATCHEWAN (Lignite).....	58	471,713	831,491	58	580,189	993,226
ALBERTA—						
Bituminous.....	19	3,215,494	11,190,180	17	3,094,147	10,851,499
Sub-bituminous.....	20	740,496	2,076,212	19	668,702	1,908,954
Lignite.....	240	3,380,340	10,266,022	245	3,387,844	10,167,729
Total.....	279	7,336,330	23,532,414	281	7,150,693	22,928,182
BRITISH COLUMBIA (Bituminous).....	34	2,804,594	11,094,353	26	2,490,378	10,160,789
YUKON (Bituminous).....	1	414	2,915	1	458	1,848
CANADA—						
Bituminous.....	109	12,971,744	50,584,108	91	12,859,822	49,995,261
Sub-bituminous.....	20	740,496	2,076,212	19	668,702	1,908,954
Lignite.....	298	3,852,053	11,097,513	303	3,968,033	11,160,955
Total.....	427	17,564,293	63,757,833	413	17,496,557	63,065,170

Table 191.—Disposition of Coal from Canadian Mines, 1928 and 1929

	1928			1929		
	Total coal	Total value	Average value per ton	Total coal	Total value	Average value per ton
		\$	\$		\$	\$
Supplied to employees for domestic consumption.....	191,996	643,710	3.35	204,581	707,280	3.46
Used for power purposes—						
(a) Shops.....	93,911	340,215	3.62	108,509	392,114	3.61
(b) Colliery boilers.....	844,846	2,574,641	3.05	795,663	2,379,147	2.99
(c) Companies' railroads.....	73,479	288,902	3.93	75,704	300,144	3.96
(d) Harbour tugs and dredges.....	1,432	5,761	4.02	724	2,966	4.10
Shipped—(see table 194)						
(a) Ships' bunkers.....	543,223			365,422		
(b) Railroads.....	5,296,510	59,364,965	3.71	5,210,989	58,272,666	3.68
(c) Other.....	10,179,749			10,247,724		
Used in making coke at colliery.....	103,719	368,204	3.55	115,482	409,960	3.55
Used in making briquettes.....	22,883	85,808	3.75	105,635	194,639	1.84
Put on bank.....	727,519	2,817,034	3.87	1,006,497	3,806,745	3.78
Put on waste heap.....	299,104			235,284		
Total disposition.....	18,378,371	66,489,240	3.62	18,472,214	66,465,661	3.60
Lifted from bank.....	814,078	2,731,407	3.36	975,657	3,400,491	3.49
Total output.....	17,564,293	63,757,833	3.62	17,496,557	63,065,170	3.60

Table 192.—Disposition of Coal from Canadian Mines by Provinces, 1928

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	121,551	3,305	2,916	41,856	22,368		191,996
Coal shipped.....	6,157,049	195,008	429,975	6,895,221	2,341,940	289	16,019,482
Used under colliery boilers, etc.....	366,829	7,723	35,038	240,209	195,042	5	844,846
Used by companies' railroads.....	47,338	1,380	2,933	7,471	14,357		73,479
Used for manufacture of coke at colliery.....					103,719		103,719
Used in making briquettes.....				22,883			22,883
Used in shops, etc.....	93,911						93,911
Used by harbour tugs and dredges.....	1,432						1,432
Put on bank.....	599,774	13,367	2,006	58,942	53,430		727,519
Put on waste heap.....	19,523	55	652	121,546	157,208	120	299,104
Total disposition.....	7,407,407	220,838	473,520	7,338,128	2,888,064	414	18,378,371
Lifted from bank.....	663,903	13,100	1,807	51,798	83,470		814,078
Total output.....	6,743,504	207,738	471,713	7,336,330	2,804,594	414	17,564,293

Table 193.—Disposition of Coal from Canadian Mines by Provinces, 1929

(Short tons)

	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption.....	129,840	3,400	3,779	45,490	22,059	13	204,581
Coal shipped.....	6,363,984	207,904	459,302	6,713,906	2,078,818	221	15,824,135
Used under colliery boilers, etc.....	365,492	6,294	32,100	244,139	147,635	3	795,663
Used by companies' railroads.....	48,424	1,102	4,866	7,595	13,717		75,704
Used for manufacture of coke at colliery.....					115,482		115,482
Used in making briquettes.....			79,455	26,180			105,635
Used in shops, etc.....	108,509						108,509
Used by harbour tugs and dredges.....	724						724
Put on bank.....	855,026	20,740	2,605	61,183	66,943		1,006,497
Put on waste heap.....	14,844	53	614	110,179	109,373	221	235,284
Total disposition.....	7,886,843	239,493	582,721	7,208,672	2,554,027	458	18,472,214
Lifted from bank.....	830,710	20,787	2,532	57,979	63,649		975,657
Total output.....	7,056,133	218,706	580,189	7,150,693	2,490,378	458	17,496,557

Table 194.—Shipments of Coal from Canadian Mines by Grades and Destinations, 1928 and 1929

(Short tons)

Destination	1928				1929			
	Run-of-mine	Screened	Slack	Total	Run-of-mine	Screened	Slack	Total
Prince Edward Island.....	5,784	71,007	1,271	78,062	3,130	77,241	2,214	82,585
Nova Scotia.....	346,213	610,082	680,185	1,636,480	335,851	651,042	843,299	1,830,192
New Brunswick.....	212,875	134,139	117,283	464,297	214,058	150,133	129,667	493,858
Quebec.....	66,447	1,172,220	1,143,579	2,382,246	67,591	1,137,112	1,167,838	2,372,541
Ontario.....	515	35,489	9,277	45,281	703	46,330	9,236	56,269
Manitoba.....	157,133	428,167	243,110	828,410	158,420	426,495	240,024	824,939
Saskatchewan.....	227,241	1,097,591	408,959	1,733,791	259,860	1,032,840	424,147	1,716,847
Alberta.....	256,865	562,641	593,022	1,412,528	261,088	537,838	599,652	1,398,578
British Columbia.....	92,470	636,044	389,368	1,117,882	46,451	724,672	252,979	1,024,102
Yukon.....		289		289		221		221
Total domestic shipments.....	1,365,543	4,747,669	3,586,054	9,699,266	1,347,152	4,783,924	3,669,056	9,800,132
Railroads.....	4,330,869	568,028	397,613	5,296,510	4,029,986	817,399	363,604	5,210,989
Ships' bunkers.....	304,536	225,300	13,387	543,223	253,946	111,476		365,422
Total railroads and ships' bunkers.....	4,635,405	793,328	411,000	5,839,733	4,283,932	928,875	363,604	5,576,411
United States.....	14,636	122,602	60,237	197,475	19,592	104,618	53,764	177,974
Alaska.....						23,891		23,891
Newfoundland.....	5,310	262,950	7,135	275,395	9,916	234,264	540	244,720
Other places.....	486	7,127		7,613		438		438
Lost at sea.....						569		569
Total external shipments....	20,432	392,679	67,372	480,483	29,508	363,780	54,304	447,592
Total.....	6,021,380	5,933,676	4,064,426	16,019,482	5,660,592	6,076,579	4,086,964	15,824,135

Table 195.—Tonnage Lost in the Coal Mines of Canada in 1928 and 1929 Showing by Provinces the Relative Percentages Produced and Lost with an Analysis of the Percentage Lost.

Province	Per cent produced	Per cent lost	Percentage lost through				
			Absenteeism	Lack of orders	Car shortage	Mine disability	Other causes
NOVA SCOTIA.....1928	75	25	4.8	16.0	0.0	2.8	1.4
.....1929	81	19	3.8	7.3	0.0	6.5	1.4
NEW BRUNSWICK.....1928	88	12	0.6	6.5	0.0	0.1	4.8
.....1929	79	21	0.1	9.0	0.0	0.1	11.8
SASKATCHEWAN.....1928	57	43	7.7	33.5	0.3	0.1	1.4
.....1929	68	32	0.0	31.0	0.0	0.0	1.0
ALBERTA.....1928	79	21	0.8	15.3	1.9	0.7	2.3
.....1929	74	26	0.6	21.0	1.6	0.7	2.1
BRITISH COLUMBIA.....1928	88	12	1.5	8.2	1.3	0.1	0.9
.....1929	81	19	0.8	15.2	1.6	0.4	1.0
Canada.....1928	78	22	2.7	15.1	1.0	1.4	1.0
.....1929	78	22	1.8	15.0	0.8	2.8	1.0

Table 196.—Imports of Anthracite and Bituminous Coal into Canada from Great Britain, by Grades and by Provinces, 1928-1929

(Short tons)

Destination	1928			1929		
	Anthracite		Bituminous, all grades	Anthracite		Bituminous, all grades
	Egg, nut etc.	Dust		Egg, nut, etc.	Dust	
Prince Edward Island.....				2,223		21,991
Nova Scotia.....	29,314		4,381	31,612		341
New Brunswick.....	34,061		1,083	50,798	1,911	92,941
Quebec.....	428,203	13,262	137,549	592,838	5,946	
Ontario.....	19,407			44,130		95
British Columbia.....	2,220		1,132			
Canada.....	513,205	13,262	144,145	721,601	7,857	115,268

Table 197.—Imports of Anthracite, Bituminous and Lignite Coal into Canada from the United States by Grades and by Provinces, 1928 and 1929

(Short tons)

Destination	1928				1929			
	Anthracite		Bituminous, all grades	Lignite	Anthracite		Bituminous, all grades	Lignite
	Egg, nut, etc.	Dust			Egg, nut, etc.	Dust		
Prince Edward Island.....	3,765		4,076		4,121	836	8,982	
Nova Scotia.....	29,815		27,473		26,695		14,153	
New Brunswick.....	37,432	2,183	49,484		44,653	455	75,767	
Quebec.....	739,266	162,889	1,303,607		682,532	148,763	1,242,130	
Ontario.....	2,065,158	151,993	12,318,948		2,098,544	156,413	13,067,713	
Manitoba.....	8,321	1,809	97,002		6,701	2,479	38,801	1,896
Saskatchewan.....	579		2,536	60	365		2,477	41
Alberta.....			1,360				1,327	
British Columbia.....		21	17,510	10,720	484	1	18,364	12,171
Yukon.....			40				67	
Canada†.....	2,884,336	318,895	13,822,036	10,780	2,864,096	308,947	14,469,831	14,108

Table 198.—Imports and Anthracite of Bituminous Coal into Canada from Other Countries, by Provinces, 1928 and 1929

(Short tons)

Destination	Source	1928			1929		
		Anthracite		Bitu- minous, all grades	Anthracite		Bitu- minous, all grades
		Egg, nut, etc.	Dust		Egg, nut, etc.	Dust	
Nova Scotia.....	Russia.....				5,601		
New Brunswick.....	Russia.....				12,697		
Quebec.....	Netherlands.....	1,102					
	Belgium.....	1					
	Brit. S. Africa.....	328					
	Russia.....	6,204			99,006		
British Columbia.....	Newfoundland.....			2			76
	Japan.....				112		
Canada.....		7,635		2	117,416		76

Table 199.—Average Imports of Coal into Canada by Kinds and by Provinces for the Five Years 1925-1929

(Short tons)

Destination	Anthracite			Total bitumin- ous	Total all grades
	Egg, nut, etc.	Dust	Total		
Prince Edward Island.....	5,521	168	5,689	8,475	14,164
Nova Scotia.....	57,889	1	57,890	61,638	119,528
New Brunswick.....	90,254	1,286	91,540	97,799	189,339
Quebec.....	1,317,302	177,222	1,494,524	1,771,059	3,265,583
Central Ontario.....	2,114,844	127,347	2,242,191	10,654,054	12,896,245
Head of Lakes.....	59,786	429	60,215	1,371,227	1,431,442
Total Ontario.....	2,174,630	127,776	2,302,406	12,025,281	14,327,687
Manitoba.....	13,987	3,529	17,516	115,538	133,054
Manitoba and Head of Lakes	73,773	3,958	77,731	1,486,765	1,564,496
Saskatchewan.....	519		519	2,175	2,694
Alberta.....	6		6	1,340	1,346
British Columbia.....	2,524	4	2,528	39,104	41,632
Yukon.....				25	25
Canada.....	3,662,632	309,956	3,972,618	14,122,434	18,095,952

Table 200.—Average Imports of Coal into Central Canada by Principal Areas for the Five Years 1925-1929

(Short tons)

Destination	Anthracite			Total bituminous	Total all grades
	Egg, nut, etc.	Dust	Total		
Quebec.....	99,506	5,293	104,799	183,447	288,246
Montreal.....	1,191,547	170,237	1,361,784	1,470,366	2,832,150
Ottawa.....	231,361	42,391	273,752	939,493	1,213,245
Kingston.....	101,168	2,199	103,367	222,551	325,918
Toronto.....	1,509,537	79,259	1,588,796	5,095,926	6,684,722
Windsor.....	273,998	3,689	277,687	3,197,487	3,475,174
Total.....	3,407,117	303,065	3,710,185	11,109,270	14,819,455

Table 201.—Exports of Canadian Coal by Destination, 1927-1929

(Compiled in the External Trade Branch)

Destination	1927		1928		1929	
	Short tons	Value	Short tons	Value	Short tons	Value
BRITISH EMPIRE		\$		\$		\$
United Kingdom.....	62,163	451,451	27,390	202,252	26,605	195,958
Irish Free State.....	131,218	682,295	484	3,003	683	4,343
British South Africa.....	9,923	67,865	4,578	27,468	12,089	74,057
Bermuda.....	646	5,315	198	1,595	950	7,600
British Guiana.....			1,066	6,393		
British India.....	157	1,413	514	4,266		
British West Indies—						
Jamaica.....	575	3,536	3,017	25,040		
Other B.W.I.....	353	2,910				
Gibraltar.....	790	4,740	3,924	23,892	1,335	8,010
Malta.....			161	1,525		
Newfoundland.....	281,872	1,473,336	246,100	1,301,592	269,168	1,426,701
Sierra Leone.....	1,247	7,794	433	3,572		
Australia.....	23,895	182,730	22,458	186,310	19,225	159,409
New Zealand.....	15,479	90,663	6,994	40,214	6,752	41,834
Total British Empire.....	528,318	2,974,048	317,317	1,826,925	336,807	1,917,912
FOREIGN COUNTRIES						
Argentina.....			4,046	24,276	1,066	6,396
Belgium.....	10,988	76,074	7,354	49,695	3,463	20,406
Brazil.....			4,046	24,276		
China.....	2,155	15,192	499	4,141	4,994	41,448
Cuba.....	194	1,676	1,015	8,631	380	3,135
Denmark.....	909	5,762	513	3,163	758	4,548
Egypt.....	236	2,006				
Finland.....			147	882		
France.....	3,218	23,116	1,701	11,666	5,108	35,171
French Possessions—						
French Africa.....	226	1,356	1,737	10,419		
French Oceania.....	637	3,758				
Morocco.....	144	1,296				
St. Pierre and Miquelon.....	5,291	32,380	5,742	34,831	2,248	13,746
Syria.....			333	1,998	290	1,740
Germany.....	10,353	71,084	5,622	36,843	2,140	12,741
Greece.....	2,027	12,264	3,283	20,139	1,085	8,097
Honduras.....			276	1,380		
Iceland.....			135	844		
Italy.....	18,108	113,814	8,181	50,338	3,327	22,991
Japan.....	6,664	47,635	5,970	38,870		
Mexico.....	7,002	58,116				
Netherlands.....	5,590	31,885	7,467	55,120	5,247	35,510
Norway.....	3,863	21,243	1,764	11,142	421	2,521
Poland and Danzig.....			398	2,491	371	2,489
Portugal.....	598	3,588	1,672	12,829		
Russia.....			361	2,166		
Spain.....	501	3,006	3,221	19,512	916	5,493
Sweden.....	477	2,911	680	4,080	552	3,162
Turkey.....			383	2,298	641	4,352
United States.....	477,362	2,163,374	455,495	2,028,482	451,516	2,080,807
Alaska.....	27,150	216,713	22,298	168,381	21,642	152,663
Porto Rico.....			264	1,650		
Virgin Islands.....	518	3,056				
Uruguay.....	801	5,006	2,021	12,631		
Total foreign countries.....	585,012	2,916,311	546,624	2,643,074	506,165	2,457,416
Total.....	1,113,330	5,890,359	863,941	4,469,999	842,972	4,375,328

Table 202.—Annual Consumption of Coal in Canada, 1902-1929

Calendar year	Canadian†		Imported coal "entered for consumption"				Total	Per capita
			From U.S.A.	From Great Britain	Total*			
	Short tons	%	Short tons	Short tons	Short tons	%	Short tons	Short tons
1902.....	5,376,413	53.1	4,656,286	101,726	4,734,559	46.9	10,110,972	1-848
1903.....	6,005,735	47.3	6,520,931	184,593	6,678,450	52.7	12,684,185	2-212
1904.....	6,697,183	47.9	7,238,869	85,687	7,297,482	52.1	13,994,665	2-412
1905.....	7,032,661	49.4	7,233,738	68,500	7,215,446	50.6	14,249,107	2-341
1906.....	7,927,560	50.5	7,787,338	67,014	7,758,325	49.5	15,685,885	2-481
1907.....	8,617,352	45.0	10,588,697	54,325	10,549,503	55.0	19,166,855	2-947
1908.....	9,156,478	47.3	10,203,335	97,514	10,195,424	52.7	19,351,902	2-820
1909.....	8,913,376	47.9	9,805,253	67,671	9,711,826	52.1	18,625,202	2-682
1910.....	10,532,103	50.2	10,545,451	51,541	10,437,123	49.8	20,970,226	2-960
1911.....	9,822,749	40.5	14,510,129	48,963	14,424,949	59.5	24,247,698	3-365
1912.....	12,385,696	46.0	14,557,124	38,668	14,549,104	54.0	26,934,800	3-657
1913.....	13,450,158	42.6	18,145,769	37,825	18,132,387	57.4	31,582,545	4-196
1914.....	12,214,403	45.5	14,687,853	33,101	14,637,920	54.5	26,852,323	3-490
1915.....	11,500,480	48.1	12,450,786	15,098	12,406,212	51.9	23,906,692	3-041
1916.....	12,348,036	41.3	17,576,202	4,401	17,517,820	58.7	29,865,856	3-717
1917.....	12,313,603	37.2	20,848,009	9,451	20,810,132	62.8	33,123,735	4-049
1918.....	13,160,731	37.8	21,674,826	3,761	21,611,101	62.2	34,771,832	4-175
1919.....	11,611,168	40.3	17,292,913	344	17,236,269	59.7	28,847,437	3-402
1920.....	14,025,566	42.9	18,752,981	.....	18,668,741	57.1	32,694,307	3-788
1921.....	12,715,734	41.1	18,300,081	1,591	18,258,387	58.9	30,974,121	3-524
1922.....	13,044,352	50.2	12,255,555	765,980	12,962,189	49.8	26,006,541	2-909
1923.....	15,070,962	41.8	20,417,239	572,570	20,967,971	58.2	36,038,933	3-968
1924.....	12,529,358	42.8	16,405,344	317,112	16,714,143	57.2	29,243,501	3-100
1925.....	12,125,290	42.6	15,744,957	604,117	16,331,971	57.4	28,457,261	3-039
1926.....	15,449,831	48.3	16,204,405	287,299	16,565,555	51.7	32,015,386	3-329
1927.....	16,313,531	46.6	17,769,963	907,230	18,680,832	53.4	34,994,363	3-676
1928.....	16,700,352	49.3	16,515,149	682,755	17,200,043	50.7	33,900,395	3-510
1929.....	16,653,585	47.8	17,243,047	843,502	18,186,727	52.2	34,840,312	3-556

†The sum of Canadian coal mine sales, colliery consumption, coal supplied to employees, and coal used in making coke, etc., less the tonnage of coal exported.

*Includes small tonnages from countries other than Great Britain and United States. Deductions have been made to take account of foreign coal re-exported from Canada.

Table 203.—Summary Statistics for 1929-Output, Exports, Interprovincial Shipments, Imports and Coal made Available for Consumption in Canada, by Provinces

(Short tons)

Province	Canadian coal				Imported from U.S.A.	Imported from Great Britain	Imported from other countries	Coal available for consumption
	Output	Received from other provinces	Shipped to other provinces	Exported				
PRINCE EDWARD ISLAND—								
Anthracite.....					4,957	2,223		7,180
Bituminous.....		82,585			8,982			91,567
Total.....		82,585			13,939	2,223		98,747
NOVA SCOTIA—								
Anthracite.....					26,695	31,612 (a)	5,601	63,908
Bituminous.....	7,056,133		2,889,053	351,176	14,153	21,991		3,852,048
Total.....	7,056,133		2,889,053	351,176	40,848	53,603	5,601	3,915,956
NEW BRUNSWICK—								
Anthracite.....					45,108	52,709 (a)	12,697	110,514
Bituminous.....	218,706	427,236	295	20,609	75,767	341		701,146
Total.....	218,706	427,236	295	20,609	120,875	53,050	12,697	811,660
QUEBEC—								
Anthracite.....					831,296	598,784 (a)	99,006	1,529,086
Bituminous.....		2,372,541		130	1,242,180	92,941 (b)	76	3,707,608
Total.....		2,372,541		130	2,073,476	691,725	99,082	5,236,694
CENTRAL ONTARIO—								
Anthracite.....					2,202,236	44,130		2,246,366
Bituminous.....				110	11,332,168			11,332,058
Sub-bituminous.....		*10,195						10,195
Lignite.....		*46,074		36				46,088
Total.....		56,269		146	13,534,404	44,130		13,634,657
MANITOBA AND HEAD OF LAKES—								
Anthracite.....					61,901			61,901
Bituminous.....		46,804		397	1,774,346			1,820,753
Sub-bituminous.....		91,867						91,867
Lignite.....		686,268		2,937	1,896			685,227
Total.....		824,939		3,334	1,838,143			2,659,748
SASKATCHEWAN—								
Anthracite.....					365			365
Bituminous.....		150,612		76	2,477			153,013
Sub-bituminous.....		74,560						74,560
Lignite.....	580,189	1,300,783	231,858	8,151	41			1,641,004
Total.....	580,189	1,525,955	231,858	8,227	2,883			1,868,942
ALBERTA—								
Bituminous.....	3,094,147	47,926	178,833	45	1,327			2,964,522
Sub-bituminous.....	668,702		230,303					438,399
Lignite.....	3,387,844		1,936,974	1,015				1,449,855
Total.....	7,150,693	47,926	2,346,110	1,060	1,327			4,852,776
BRITISH COLUMBIA—								
Anthracite.....					485		(c) 112	597
Bituminous.....	2,490,378	52,402	111,925	438,286	18,364	95		2,011,028
Sub-bituminous.....		53,681						53,681
Lignite.....		135,707		20,004	12,171			127,874
Total.....	2,490,378	241,790	111,925	458,290	31,020	95	112	2,193,180
YUKON—								
Bituminous.....	458				67			525
Total.....	458				67			525
CANADA—								
Anthracite.....					3,173,043	729,458	117,416	4,019,917
Bituminous.....	12,859,822	3,180,106	3,180,106	810,829	14,469,831	115,368	76	26,634,268
Sub-bituminous.....	668,702	230,303	230,303					668,702
Lignite.....	3,968,033	2,168,832	2,168,832	32,143	14,108			3,949,998
Total.....	17,496,557	5,579,241	5,579,241	842,972	17,656,982	844,826	117,492	35,272,885

(a) Imported from Russia. (b) Imported from Newfoundland. (c) Imported from Japan.

*Includes all coal shipped to any point in Ontario from western mines.

Table 204.—World Production of Coal* 1925-1929

(Including brown coal)

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Great Britain—					
Anthracite.....	6,126,389	2,876,655	6,346,890	5,521,570	6,364,036
Bituminous.....	237,049,842	123,401,866	244,885,446	231,950,361	251,542,766
Lignite.....			502	640	322
Nigeria (b).....	238,966	324,575	357,899	359,316	344,937
Southern Rhodesia.....	678,320	860,338	894,396	1,077,557	1,020,446
Union of South Africa.....	12,127,188	12,745,492	12,381,692	12,407,539	12,812,790
Canada—					
Bituminous.....	7,981,792	11,065,249	11,613,389	11,580,241	11,481,984
Sub-bituminous.....	509,513	437,264	532,281	661,157	597,055
Lignite.....	3,236,345	3,210,104	3,414,027	3,432,078	3,542,887
British Borneo—					
State of North Borneo.....	79,941	71,434	62,701	60,779	†
Sarawak.....	19,678	19,683	16,445	17,679	13,610
Federated Malay States.....	408,084	464,284	463,001	556,590	661,514
India—					
Gondwana Coalfields.....	20,447,898	20,583,202	21,664,488	22,153,314	23,418,734
Tertiary Coalfields.....	456,479	415,965	417,848	389,558	
Australia—					
Bituminous.....	13,626,777	13,250,000	13,522,960	11,839,780	10,365,319
Lignite.....	876,468	957,935	1,455,482	1,591,858	1,741,176
New Zealand—					
Bituminous.....	1,044,726	1,196,388	1,290,529	1,348,732	1,367,164
Brown coal.....	911,425	905,825	954,436	973,238	1,049,603
Lignite.....	158,844	137,786	121,775	114,783	119,097
Total.....	306,000,000	193,000,000	320,000,000	306,000,000	327,000,000
FOREIGN COUNTRIES					
Austria—					
Bituminous.....	142,907	154,824	172,828	198,906	204,735
Brown coal.....	2,985,470	2,911,015	3,015,675	3,211,042	3,469,123
Belgium—					
Anthracite and semi-anthracite.....	4,769,356	5,247,611	5,899,589	6,035,006	26,506,115
Bituminous.....	17,962,898	19,613,048	21,216,242	21,107,733	
Bulgaria—					
Anthracite.....				1,183	1,643,000
Bituminous.....	71,827	1,186,713	1,218,099	67,255	
Brown coal.....	1,131,353			1,339,298	
Czechoslovakia—					
Bituminous.....	12,360,640	13,953,092	13,794,932	14,330,345	16,485,750
Brown coal.....	18,310,843	18,223,237	19,310,756	20,128,419	21,155,637
France—					
Saar.....	12,784,692	13,464,803	13,391,097	12,899,716	13,364,882
Other districts—					
Anthracite and bituminous.....	46,353,460	50,579,865	50,960,760	50,554,526	52,887,804
Lignite.....	977,663	1,044,363	1,050,434	1,046,891	1,168,653
Germany—					
Bituminous.....	130,527,542	143,000,979	151,173,466	148,477,965	160,855,794
Brown coal.....	137,517,857	136,952,867	148,126,913	162,972,863	172,411,240
Greece—					
Brown coal.....	139,832	150,899	141,082	118,734	†
Hungary—					
Bituminous.....	776,943	813,846	773,447	770,908	813,220
Brown coal.....	5,417,385	5,561,158	5,983,940	6,240,930	6,659,925
Lignite.....		169,185	160,839	164,838	272,765
Italy—					
Anthracite.....	14,076	15,460	16,573	10,321	945,000
Bituminous.....	171,468	190,495	149,293	115,590	
Brown coal.....	1,088,015	1,162,684	898,047	686,024	
Jugoslavia—					
Bituminous.....	175,638	187,800	283,184	351,826	435,131
Brown coal.....	2,591,589	2,965,800	3,433,470	3,608,130	4,326,603
Lignite.....	959,027	921,754	954,586	1,012,136	1,036,945
Netherlands—					
Bituminous.....	6,740,404	8,471,616	9,175,868	10,525,314	11,398,293
Brown coal.....	204,344	207,858	198,201	193,589	154,095
Poland—					
Bituminous.....	28,622,028	35,182,768	37,482,601	39,974,905	45,685,654
Brown coal.....	64,638	74,825	77,225	72,398	
Portugal—					
Anthracite.....	133,306	197,353	201,127	195,705	175,864
Bituminous.....				2,460	18,098
Brown coal.....	17,716	34,306		26,031	28,880
Rumania—					
Bituminous.....	308,620	317,102	367,559	391,285	365,088
Brown coal.....	2,573,973	2,688,224	2,804,999	2,588,144	2,632,831

Table 204.—World Production of Coal* 1925-1929—Concluded

(Including brown coal)

(Long tons)

Country	1925	1926	1927	1928	1929
Russia—					
Anthracite.....	3,292,173	5,279,743	32,026,639	34,657,125	38,084,000
Bituminous—					
European.....	9,850,930	15,009,393			
Asiatic.....	1,603,818	2,830,323			
Brown coal.....	1,492,943	2,256,761			
Spain—					
Anthracite.....	311,047	396,494	423,106	383,243	532,705
Bituminous.....	5,709,680	6,036,364	6,036,177	5,885,667	6,340,606
Brown coal.....	396,330	393,515	422,817	415,831	395,695
Spitzbergen and Bear Island.....	406,768	286,531	314,380	280,418	†
Sweden.....	259,711	377,613	392,007	352,851	388,737
Algeria.....	9,879	13,514	20,932	16,368	15,873
Belgian Congo.....	80,000	88,800	86,000	88,000	112,642
Tunis (brown coal).....				(f)	
Greenland.....	2,500	1,500	2,900	2,500	†
Mexico.....	1,421,684	1,288,462	1,015,020	999,787	1,043,277
United States—					
Anthracite.....	55,193,883	75,390,582	71,513,896	67,275,062	65,918,031
Bituminous (e).....	464,332,804	511,934,807	462,288,707	447,093,723	475,314,000
Brazil.....	386,070	400,000	231,294	246,327	†
Chile.....	1,450,277	1,466,968	1,458,113	1,353,890	1,482,661
Peru.....	100,142	168,063	159,806	175,675	†
Venezuela.....	24,528	15,676	15,850	15,660	16,593
China (d).....	21,000,000	22,000,000	23,000,000	20,000,000	†
Dutch East Indies.....	1,378,602	1,443,200	1,594,616	1,676,472	1,583,000
Formosa.....	1,677,659	1,766,169	1,772,005	1,513,000	†
French Indo-China—					
Anthracite.....	1,288,888	1,226,943	1,422,083	1,883,409	1,883,400
Bituminous.....	46,907	37,428	38,041	39,826	38,200
Brown coal.....	5,648	5,510	7,038	15,228	30,300
Japan—					
Semi-anthracite.....	88,458	128,322	141,181	163,263	31,451,000
Bituminous.....	30,874,100	30,801,888	32,859,856	33,162,143	
Brown coal.....	166,750	158,589	175,792	119,997	
Karafuto.....	246,657	271,463	351,407	530,961	
Korea—					
Anthracite.....	614,379	672,111	698,371	457,611	529,744
Bituminous.....				315,322	393,345
Philippine Islands.....	47,183	47,912	23,040	27,417	†
Turkey in Asia (f).....	733,235	1,215,095	892,310	912,646	1,406,415
New Caledonia.....	1,300	15,000	†	16,000	†
Total.....	1,040,000,000	1,150,000,000	1,130,000,000	1,130,000,000	1,200,000,000
Total.....	1,350,000,000	1,343,000,000	1,450,000,000	1,440,000,000	1,530,000,000

*Data obtained from *The Mineral Industry of the British Empire and Foreign Countries*.

† Information not available.

(a) Including a small quantity of anthracite mined in the Fife and Clackmanan districts.

(b) Years ended 31st March of the year following that stated.

(c) Including brown coal.

(d) Approximate production.

(e) Exports.

(f) Eregli-Zoungouldak coal basin.

COKE AND ARTIFICIAL GAS

Canada's coke and gas industry in 1929 included the operation of 43 establishments, with a total capital investment of \$94,749,062. These plants furnished employment to 3,902 employees whose earnings totalled \$5,938,814.

Output of gas-house and by-product coke in Canada during 1929 totalled 2,716,142 tons, an increase of 402,015 tons over the record production in 1928 of 2,314,127 tons. By-product coke plants produced 2,410,790 tons in 1929 while only 305,352 tons were obtained from artificial gas plants. In addition, 109,516 tons of petroleum coke were recovered as a by-product of petroleum refining.

Production of gas totalled 38,925,086 M cu. ft. of which 9,913,999 M cu. ft. were produced in gas plants and 29,011,087 M cu. ft. in by-product coke ovens. Sales of gas reached 17,649,371 M cu. ft. worth \$13,316,684; most of the remaining gas was used for fuel in the reporting plants or associated metallurgical works. In addition to the output shown above, 3,140,187 M cu. ft. of still gas were made in petroleum refineries for their own use.

Imports of coke into Canada amounted to 1,226, 853 tons in 1929, an increase of 16 per cent over the 1928 total of 1,060,029 tons. Exports of by-product and gas coke totalled 16,993 tons as compared with 25,058 tons in 1928. Petroleum coke amounting to 27,922 tons was exported during 1929 as against 19,857 tons in the preceding year.

Table 205.—Materials used in the Coke and Gas Industry in Canada, 1927-1929

Materials	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
Bituminous coal:—		\$		\$		\$
(a) Canadian..... tons	878,029	3,076,271	909,539	3,144,963	961,391	3,308,849
(b) Foreign..... tons	1,987,280	10,816,801	2,289,660	11,674,045	2,696,168	12,676,139
Anthracite coal for gas-making..... tons	225	3,130	1,317	15,362		
Coke for gas-making:—						
(a) Purchased..... tons	6,729	72,957	9,630	102,462	7,728	73,080
(b) Companies' own make..... tons	144,834	870,423	96,476	637,083	140,078	1,006,941
Oil (gas oil) for gas-making..... imp. gal.	14,548,244	1,364,546	11,898,419	1,008,226	9,364,684	787,855
Calcium carbide..... lb.	293,090	13,004	148,410	6,272	82,740	3,398
Lime..... tons	1,355	14,867	2,527	20,508	2,302	21,769
Water.....		7,012		14,734		34,222
Oxide or purifying materials..... tons	2,948	32,315	2,753	21,882	4,959	49,775
Sulphuric acid, 66°Bé..... lb.	28,946,000	240,978	46,366,147	325,067	54,314,786	406,462
All other materials.....		102,599		193,642		148,724
Total cost.....		16,614,903		17,164,246		18,517,214

Table 206.—Production in Canada, Imports and Exports of Coke and its By-Products, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
Coke—		\$		\$		\$
PRODUCTION—by provinces—						
Nova Scotia and New Brunswick..... tons	417,380	2,020,953	463,093	2,189,648	499,080	2,436,683
Quebec..... tons	144,538	794,959	240,204	1,736,843	351,372	2,822,763
Ontario..... tons	1,260,355	8,542,988	1,443,512	9,332,926	1,624,884	11,112,809
Manitoba..... tons	35,641	386,071	34,641	337,446	44,597	461,504
British Columbia..... tons	168,524	1,219,241	132,677	938,848	157,648	1,113,899
Total..... tons	2,026,438	12,964,212	2,314,127	14,535,711	2,677,581	17,947,658
IMPORTS..... tons	772,235	4,742,223	1,060,029	6,102,842	1,226,853	6,659,514
EXPORTS..... tons	74,109	533,638	25,058	183,728	25,208	189,247
APPARENT CONSUMPTION..... tons	2,724,564	17,172,798	3,349,088	20,454,825	3,879,226	18,947,411
Other Products						
*PRODUCTION—						
Ammonium sulphate..... tons	24,708	1,030,991	28,090	1,108,744	34,140	1,296,952
Gas: (a) Sales..... M cu.ft.	14,658,495	15,653,591	15,606,609	13,933,537	17,649,371	13,316,684
(b) Used in own plants..... M cu.ft.	6,312,346	1,136,816	7,058,981	1,369,655	7,671,383	1,758,741
(a) Used in metallurgical works..... M cu.ft.	10,560,393	1,268,200	11,237,155	1,295,644	12,870,553	1,411,670
(d) Not accounted for..... M cu.ft.	1,324,935		1,156,175	211,327	733,779	888,122
Light oils..... imp. gal.	2,965,583	316,557	4,052,859	500,365	6,058,061	874,012
Tar and tar products..... imp. gal.	25,647,309	1,631,276	27,141,332	1,721,432	30,119,476	1,963,746
Ammonia liquor..... pound N.H ₃	1,438,888	38,034	1,644,516	25,867	1,694,538	25,631
All other products.....		5,072		6,145		4,979
IMPORTS—						
Ammonium sulphate..... tons	3,181	160,150	3,510	174,899	1,723	80,019
Coal tar and pitch..... gal.	3,812,637	286,307	6,003,182	438,244	6,429,566	518,878
EXPORTS—						
Ammonium sulphate..... tons	16,947	730,815	13,632	561,696	24,489	909,510
Tar and pitch..... gal.	2,914,642	277,793	3,572,781	311,031	3,069,247	140,541

*Production data include the output of the Coke and its By-products Industry and of the Illuminating and Fuel Gas Industry.

NATURAL GAS

Natural gas production in Canada continues to increase and during 1929 a new high mark was set up for the industry. Production during the year amounted to 28,378,462 thousand cubic feet valued at \$9,977,124, an increase of 25.7 per cent in quantity and 15.8 per cent in value over the production in 1928 of 22,582,586 thousand cubic feet at \$8,614,182. Alberta was the leading producing province with a production of 19,112,182 thousand cubic feet; Ontario came next with 8,586,475 thousand cubic feet; and New Brunswick followed with 678,456 thousand cubic feet. There was also a small production from several private wells in Manitoba. Average per thousand cubic feet were as follows: New Brunswick, 49.1 cents; Ontario, 57.8 cents; and Alberta, 24.5 cents.

New Brunswick's natural gas is obtained from wells in the Stoney Creek field near Moncton. In 1929, approximately 5,200 domestic and industrial consumers in Moncton and Hillsboro were supplied with gas from this field.

Notable features of the gas industry in Ontario during 1929 were the drilling of two large productive wells in Kent county, and the completion of a gas-producing plant at Windsor, to be used entirely as a stand-by, only operating when the supply of gas fails. This plant has a capacity of 6,000 thousand cubic feet per day. Causes contributory to the increase in natural gas production in Ontario during 1929 were threefold, first, an increase in the number of consumers, second, increased consumption by industrial users, and third, the prevailing cold weather in November and December.

The Turner Valley field, located about 35 miles southwest of Calgary, Alberta, was the principal producing field in Canada during 1929. Wet gas obtained from wells in this field is stripped of its naphtha, then the sulphur content of the gas to be piped to Calgary is removed by scrubbing. During 1929, there were over 17,400 domestic and industrial consumers of natural gas in Calgary. In addition to the Calgary consumption, considerable quantities of gas are used for drilling purposes in the Turner Valley. The total natural gas used from this field in 1929 amounted to 12,183,853 thousand cubic feet; it is estimated that an additional 45,202,400 thousand cubic feet were wasted.

Gas from the Bow Island and Foremost fields was piped to Calgary during the year under review.

Consumption of natural gas in Medicine Hat amounted to 2,983,554 thousand cubic feet in 1929. The 28 wells in operation in this field supplied approximately 2,500 industrial and domestic consumers. Redcliff, 2 miles west of Medicine Hat had 8 producing wells in 1929 and 603,348 thousand cubic feet of natural gas were consumed by domestic and industrial users during the year; a glass plant and three clay products plants were the principal consumers.

Edmonton's supply of natural gas is obtained from the Viking field, located about 80 miles southeast of the city. In 1929, over 9,400 consumers in Edmonton used this gas. This field also supplied gas to approximately 600 users outside of Edmonton.

More than 300 consumers in Wainwright were supplied with gas from the Maple Leaf well in 1929. Bow Island, Suffield, and Wetaskiwin were users of gas obtained from local wells. Lethbridge and some smaller centres were furnished with gas from the Canadian Western Natural Gas Company's pipe line.

Imports of mixed gas (natural and artificial) into Canada from the United States in 1929 totalled 132,942 thousand cubic feet valued at \$85,338; in the preceding year 128,004 thousand cubic feet with a value of \$82,681 were imported.

The 145 firms operating in Canada during 1929 reported fixed and current assets amounting to \$68,592,709. This industry provided employment to 1,953 salaried employees and wage-earners, who received a total remuneration of \$2,275,147. The cost of fuel and electricity used during the year amounted to \$41,590. Primary power employed in 1929 consisted of 147 units with a total manufacturers' rating of 2,555 h.p.

Table 207.—Production of Natural Gas in Canada, by Provinces, 1920-1929

(For the years 1892 to 1919 see Mineral Production of Canada, 1928)

Year	New Brunswick		Ontario		Manitoba		Alberta		Canada	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
1920.....	682,502	\$ 130,506	10,529,374	\$ 2,920,731	200	\$ 60	5,633,442	\$ 1,181,345	16,845,518	\$ 4,232,642
1921.....	708,743	139,375	8,422,774	3,080,130	200	60	4,945,884	1,374,599	14,077,601	4,594,164
1922.....	753,898	148,040	8,060,114	4,076,296	200	60	5,868,439	1,622,105	14,682,651	5,846,501
1923.....	640,300	126,068	8,128,413	4,066,244	200	60	7,191,670	1,692,246	15,960,583	5,884,618
1924.....	599,972	113,577	7,150,078	3,798,381	200	60	7,131,086	1,796,618	14,881,336	5,708,636
1925.....	639,235	122,394	7,143,962	3,958,006	200	60	9,119,500	2,752,545	16,902,897	6,833,005
1926.....	648,316	128,300	7,764,996	4,409,593	200	60	10,794,697	3,019,221	19,208,209	7,557,174
1927.....	630,755	124,637	7,311,215	4,331,780	200	60	13,434,621	3,586,533	21,376,791	8,043,010
1928.....	660,931	324,344	7,632,800	4,535,312	200	60	14,288,605	3,754,466	22,552,586	8,614,182
1929.....	678,456	333,002	8,586,475	4,959,695	600	180	19,112,931	4,684,247	28,378,462	9,977,124

Table 208.—Capital Employed in the Natural Gas Industry in Canada by Provinces, 1928 and 1929

	1928			1929		
	Ontario	Alberta	Canada	Ontario	Alberta	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, plant, machinery and tools.....	31,064,794	22,330,394	53,395,188	33,411,510	24,115,323	57,526,833
Cost of supplies and stocks on hand.....	620,221	270,555	890,776	623,512	269,115	892,627
Cash, trading and operating accounts and bills receivable.....	5,186,892	2,329,528	7,516,420	6,661,271	1,720,715	8,381,986
Total.....	36,871,907	24,930,477	*62,073,384	40,696,293	26,105,153	*68,592,709

* Includes data for New Brunswick.

Table 209.—Number of Gas Wells in Canada, by Provinces, 1927, 1928 and 1929

	New Brunswick	Ontario	Manitoba	Alberta	Canada	
Productive wells at beginning of year.....	1927..... 1928..... 1929.....	*35 26 28	2,126 2,172 1,922	2 3 3	84 86 84	2,247 2,287 2,037
Number of productive wells drilled.....	1927..... 1928..... 1929.....	3 2 2	119 126 118	..... ..... .....	3 2 8	125 130 128
Number of dry wells drilled.....	1927..... 1928..... 1929.....	..... ..... .....	30 51 76	..... ..... .....	1 2	31 53 76
Number of wells abandoned.....	1927..... 1928..... 1929.....	..... ..... .....	62 54 42	..... ..... .....	1 5 2	63 59 44
Productive wells at end of year.....	1927..... 1928..... 1929.....	*38 28 30	2,172 1,922 2,120	2 3 6	86 84 90	2,298 2,037 2,246

*Includes 12 oil wells from which gas was obtained.

Table 210.—Natural Gas Wells in Ontario, by Townships, 1928 and 1929

Township	1928				1929			
	No. of producing wells in operation Dec. 31, 1928	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year	No. of producing wells in operation Dec. 31, 1929	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year
Amabel.....	2				2			
Ancaster.....								
Bayham.....	40				40	1		
Bertie.....	85	3			84	1		
Binbrook.....	43	3			42			
Brantford.....								
Caledon E.....	2							
Caistor.....	15	1			15	1	1	5
Canboro.....	111	1			117	1		
Cayuga, North..	81	4	8	17	108	5	7	19
Cayuga, South..	38	3	2	3	56	2		
Charlottesville..	13		3		15			
Colchester, N..							1	
Crowland.....	48	5		2	47	1	3	
Dawn.....	13		4	4	13		6	
Dorchester, N..					3			
Dover, East.....					2		2	1
Dover, West.....	8	1		3	6	2	5	
Dunn.....	30	1	5	1	30		8	1
Enniskillen.....	3	1		1	2			
Euphemia.....	6					4	3	1
Gainsboro.....	4				3			
Glanford.....	11	6	4		11	3		
Gosfield.....	20			1	17			
Houghton.....	3				3			
Howard.....							3	
Humberstone.....	81	2		2	76	9		
Mersea.....	2				1			
Middleton.....	23	1			25			
Malahide.....	2				2			
Mosa.....							1	
Moulton.....	91	10			91	1		
Oneida.....	23				23			
Onondaga.....	32	1			25	2		
Rainham.....	105	1	5	23	144	1	8	33
Raleigh.....	14			1	14		1	2
Romney.....	117	1	2	10	143	1	4	3
Sarnia.....	14				5			
Seneca.....	120	8	3	6	144	1	14	24
Sherbrooke.....	11				11			
Tilbury, East..	128	4		12	132	1		1
Townsend.....					1			
Tuscarara.....	3			7	9		1	9
Wainfleet.....	37			2	36	1		
Walpole.....	81	1	11	18	137	1	8	17
Walsingham, N..	9			1	10			
Walsingham, S..	9				7	1		
Windham.....	5				8			
Willoughby.....	39				37	2		
Woodhouse.....	23		2	6	52	1		2
Private wells..	300	6	2	6	300			
Surface wells..	71	1			71			
Total.....	1,922	64	51	126	2,120	42	76	113

Table 211.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					\$	\$	\$
New Brunswick.....	4	3	14	21	18,005	22,575	40,580
Ontario.....	317	112	859	1,288	571,414	928,163	1,499,577
Alberta.....	88	22	241	351	229,500	335,991	565,491
Canada.....	409	137	1,114	1,660	818,919	1,286,729	2,105,648
1929							
New Brunswick.....	12	5	53	70	31,181	50,938	82,119
Ontario.....	374	105	890	1,369	626,818	877,926	1,504,744
Alberta.....	89	27	398	514	223,526	464,758	688,284
Canada.....	475	137	1,341	1,953	881,525	1,393,622	2,275,147

* See note page 37.

Table 212.—Wage-Earners in the Natural Gas Industry in Canada, by Months and by Provinces, 1928 and 1929

Month	1928				1929			
	New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
January.....	5	420	155	580	13	392	188	593
February.....	5	372	157	534	15	345	216	576
March.....	5	439	170	614	18	424	207	649
April.....	19	845	182	1,046	35	736	266	1,037
May.....	23	1,031	258	1,312	48	900	364	1,312
June.....	23	1,113	330	1,466	59	984	415	1,458
July.....	20	1,138	350	1,508	64	1,048	427	1,539
August.....	15	1,087	327	1,429	89	1,137	412	1,638
September.....	19	1,101	243	1,363	98	1,022	370	1,490
October.....	15	1,099	242	1,356	88	977	311	1,376
November.....	12	751	203	966	79	946	239	1,264
December.....	6	580	183	769	31	728	230	989

PEAT

In May, 1928, the peat manufacturing plant at Alfred, Ontario, resumed operations. Production was continued until September, 1928, and 10,000 tons of peat fuel were laid on the field. Of this quantity 6,000 tons were harvested, including over 5,000 tons laid down at the railway siding and about 750 tons on the field. By the end of the year 1,200 tons of peat fuel had been shipped from the bog. In addition to this 297 tons of humus were sold for soil dressing.

During 1929 the total Canadian shipments of peat amounted to 2,607 tons valued at \$13,339. Production from the St. Hyacinthe peat bog in Quebec totalled 1,607 tons. This peat was delivered locally in Montreal by trucks at \$6.50 a ton. Shipments from the Alfred bog during the year reached a total of 1,000 tons.

Table 213.—Production of Peat in Canada, 1900-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1900.....	400	1,200	1910.....	841	2,604	1921.....	1,666	6,664
1901.....	220	600	1911.....	1,463	3,817	1922.....	3,000	14,500
1902.....	475	1,663	1912.....	700	2,900	1923-24.....		
1903.....	1,100	3,300	1913.....	2,600	10,100	1925.....	1,370	8,394
1904.....	800	2,400	1914.....	685	2,470	1926-1927.....		
1905.....	80	260	1915.....	300	1,050	1928.....	1,497	5,845
1906.....	474	1,422	1916.....	300	1,500	1929.....	2,607	13,339
1907.....	50	200	1917-18.....					
1908.....	60	180	1919.....	986	6,561	Total.....	26,284	109,859
1909.....	60	240	1920.....	4,550	18,650			

THE PETROLEUM INDUSTRY IN CANADA

Including (1) Production of Crude Petroleum; and (2) Petroleum Products.

1. Production of Crude Petroleum

Crude petroleum production in Canada advanced in 1929 to a new high record for the industry of 1,117,368 barrels valued at \$3,731,764. In 1928, the output was 624,184 barrels with a value of \$2,035,300. The 1929 production consisted of 7,499 barrels from New Brunswick, 121,194 barrels from Ontario, and 988,675 barrels from Alberta.

Production from Alberta wells was made up of 971,821 barrels from the Turner Valley field, 14,093 barrels from the Wainwright-Ribstone field and 2,761 barrels from the Red Coulee and Skiff fields. Fifty-four wells were in operation in Alberta at the close of the year and drilling was in progress on 108 other wells. Drilling operations were continued in the Turner Valley, Wainwright-Ribstone, Red Coulee and other fields in Alberta; the total footage drilled during the year was 312,251 feet. In addition to this footage, approximately 16,200 feet of drilling was done in structure testing. Twenty-four new wells were drilled into production in Alberta during 1929.

Petroleum production in Ontario declined in 1929 to the lowest point on record for the province. This falling-off in output was due principally to unfavourable weather conditions.

New Brunswick's production was obtained from wells in the Stoney Creek field.

Activities in the petroleum industry in Saskatchewan were centred around drilling operations in the Rosetown, Simpson, Pike Lake, and Unity Valley fields.

Imports of petroleum and its products into Canada in 1929 were valued at \$77,839,410, an increase of 24 per cent over the 1928 total of \$62,634,866. In 1929, Canada purchased 77 per cent of her imported crude petroleum from the United States, 13 per cent from Colombia, and 10 per cent from Peru. Gasoline imports in 1929 were obtained principally from the United States and totalled 175,151,570 imperial gallons. Fuel oil importations were at a high level in 1929 reaching a total of 95,749,518 imperial gallons.

Exports of petroleum and its products from Canada were valued at \$2,728,072 in 1929. Gasoline exportations were recorded at 4,669,078 imperial gallons shipped principally to the United States, Newfoundland, Alaska, British Guiana, and St. Pierre and Miquelon. Fuel oil exports totalled 28,177,495 imperial gallons of which 56 per cent was shipped to the United States and 39 per cent to the United Kingdom.

Capital actually employed in operating and drilling oil wells in Canada during 1929 was \$54,526,398. This industry furnished employment to 233 salaried employees and 1,988 wage-earners whose combined earnings were \$3,748,689. The cost of fuel and electricity used during the year was \$293,354. Primary power employed consisted of 174 units with a total rating of 8,072 h.p., in addition to which 96 electric motors rated at 1,048 h.p. were in use.

Table 214.—Production of Crude Petroleum in Canada by Provinces, 1920-1929

(For the years 1881 to 1919 see Mineral Production of Canada 1928.)

(Barrel = 35 Imp. gal.)

Year	New Brunswick		Ontario		Alberta		Canada	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$		\$
1920.....	5,148	19,963	180,071	726,286	11,032	75,986	196,251	822,235
1921.....	7,479	33,022	172,859	559,198	7,203	49,313	187,541	641,533
1922.....	7,778	32,732	164,731	526,316	6,559	52,128	179,068	611,176
1923.....	8,826	35,642	159,400	478,149	1,943	8,227	170,169	522,018
1924.....	5,561	21,313	154,368	441,952	844	4,135	160,773	467,400
1925.....	5,376	18,766	143,134	386,555	183,491	845,394	332,001	1,250,705
1926.....	10,544	29,940	137,850	379,221	216,050	902,504	364,444	1,311,665
1927.....	18,244	41,748	139,606	288,347	318,741	1,185,948	476,591	1,516,043
1928.....	8,043	21,391	134,064	249,737	482,047	1,764,172	624,184	2,035,300
1929.....	7,499	19,909	121,194	253,678	988,675	3,458,177	1,117,368	3,731,764

Table 215.—Production of Crude Petroleum in Canada by Provinces, 1928 and 1929

Provinces	1928		1929	
	Barrels	Total value*	Barrels	Total value
		\$		\$
NEW BRUNSWICK.....	8,043	21,391	7,499	19,909
ONTARIO—				
Petrolia and Enniskillen.....	60,547	111,745	56,284	116,556
Oil Springs.....	35,653	68,086	30,789	65,915
Moore Township.....	2,148	3,952	1,230	2,547
Sarnia Township.....	1,221	2,246	749	1,551
Plympton Township.....	371	683	315	652
Bothwell.....	24,255	44,621	23,236	48,118
West Dover.....	773	1,422	715	1,481
Onondaga.....	116	406	311	1,192
Moza Township.....	7,268	13,371	6,851	14,187
Thamesville.....	1,006	1,851	427	884
Tilbury East.....	736	1,354	139	288
Dunwich.....			148	307
Total for Ontario.....	134,094	249,737	121,194	253,078
ALBERTA—				
Turner Valley.....	474,376	1,758,710	971,821	3,440,821
Wainwright-Ribstone.....	7,671	5,462	14,093	13,400
Red Coulee and Skiff.....			2,761	3,956
Total for Alberta.....	482,047	1,764,172	988,675	3,458,177
Canada.....	624,184	2,035,300	1,117,368	3,731,764

Table 216.—Petroleum Wells in Canada, by Provinces, 1928 and 1929

	New Brunswick	Ontario	Alberta	Canada
Productive wells at beginning of year.....	1928 23 1929 25	2,669 2,643	19 31	2,711 2,699
Number of productive wells drilled.....	1928 2 1929	3 1	13 24	18 25
Number of wells abandoned.....	1928	91 146	2 8	93 154
Number of dry wells drilled.....	1928	13	6 7	6 20
Number of productive wells in operation at end of year.....	1928 25 1929 25	2,643 2,443	31 54	2,699 2,522

Table 217.—Imports into Canada and Exports of Petroleum, Asphalt and their Products 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
IMPORTS—						
ASPHALT AND ITS PRODUCTS						
Asphaltum, or asphalt, solid..... tons	47,737	856,225	47,991	822,425	53,750	829,328
Asphalt, not solid.....		38,566		46,890		99,704
Asphaltum oil for paving purposes.....		70,986		95,562		23,448
CRUDE PETROLEUM, FUEL AND GAS OILS						
Crude petroleum in its natural state, .7900 specific gravity or heavier at 60 degrees temperature, when imported by oil refiners to be refined in their own factories..... gals.	684,269,831	31,043,180	853,889,703	35,237,350	1,060,000,971	46,154,347
Crude petroleum, gas oils other than naphtha, benzene and gasoline lighter than .8235 but not less than .775 specific gravity at 60 degrees..... gals.	398,046	30,043	247,624	20,269	182,035	19,599
Petroleum, crude, not in its natural state, .725 specific gravity or heavier but not heavier than .770 specific gravity at 60 degrees temperature, when imported by oil refiners to be refined in their own factories..... gals.	45,500	4,226	263,771	26,378	5,726,147	376,001
Petroleum (not including crude petroleum imported to be refined or illuminating or lubricating oils) .8235 specific gravity or heavier at 60 degrees temperature..... gals.	81,343,133	3,524,132	62,680,093	2,452,504	63,264,841	2,444,259
Petroleum, and other oils, imported by miners or mining companies or concerns for use in the concentration of ores of metals in their own concentrating establishments..... gals.	206,332	56,435	236,516	66,727	144,890	81,691
Fuel oil, ex-warehoused for ships' stores (From April 1, 1927)..... gals.	37,870,909	1,543,316	32,539,383	981,622	32,302,642	868,925
KEROSENE AND ILLUMINATING OILS						
Coal oil and kerosene, distilled, purified or refined..... gals.	4,002,839	346,848	3,950,094	353,339	4,506,255	398,010
Illuminating oils, composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon..... gals.	8,389	4,155	3,952	2,959	9,486	3,910
Coal oil and kerosene, distilled, known as "engine distillate", when .725 specific gravity and heavier, but not heavier than .770 specific gravity at 60 degrees temperature..... gals.	26,127	2,523	14,598	1,588	17,092	1,714
LUBRICATING OILS						
Lubricating oils, composed wholly or in part of petroleum, and costing less than 25 cents per gallon..... gals.	5,796,327	947,128	6,797,536	1,144,645	7,369,099	1,289,594
Lubricating oils, n.o.p..... gals.	6,741,630	2,797,435	8,690,409	3,357,818	10,035,095	4,155,353
GASOLINE AND OTHER OILS						
Gasoline under .725 specific gravity at 60 degrees temperature..... gals.	85,432,311	8,794,848	116,062,590	13,526,618	135,558,699	15,096,277
Gasoline .725 specific gravity and heavier, but not heavier than .770 specific gravity at 60 degrees temperature..... gals.	22,503,290	2,602,949	27,531,961	3,278,465	39,551,756	4,702,487
Gasoline, n.o.p..... gals.	232,727	20,897	58,565	7,335	41,115	5,322
All other oils, n.o.p..... gals.	190,983	124,033	211,832	149,548	194,794	137,337
OTHER PRODUCTS OF PETROLEUM						
Grease, axle..... lb.	4,920,965	277,128	5,245,699	293,682	7,010,528	383,513
Paraffine wax..... lb.	3,820,893	182,725	2,247,547	107,223	3,299,236	135,169
Paraffine wax candles..... lb.	435,602	96,183	396,717	88,798	393,158	85,543
Vaseline and all similar preparations of petroleum for toilet, medicinal or other purposes.....		198,501		240,966		250,753
Petroleum, products of, n.o.p..... gals.	1,745,896	282,032	1,860,009	332,155	1,828,536	297,126
Total.....		53,844,494		62,634,866		77,839,410
EXPORTS—						
Oil petroleum, crude..... gals.	18,793,254	923,948	21,531,929	1,093,586	28,177,495	1,548,288
Oil, coal and kerosene, refined..... gals.	1,759,838	191,533	1,297,081	127,391	1,367,241	137,160
Oil, gasoline and naphtha..... gals.	2,463,379	431,011	3,957,557	686,256	4,669,078	875,027
Oil, mineral, n.o.p..... gals.	258,251	81,147	279,946	85,014	433,634	105,426
Wax, mineral..... cwt.	3,609	21,327	10,010	54,501	11,556	62,171
Total.....		1,648,966		2,051,748		2,728,072

Table 218.—Capital Employed in the Petroleum Industry in Canada, by Provinces, 1928 and 1929

	1928				1929			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
CAPITAL EMPLOYED AS REPRESENTED BY—	\$	\$	\$	\$	\$	\$	\$	\$
Cost of lands, buildings, plant machinery and tools.....	1,958,936	250,000	22,274,176	24,483,112	1,940,658	397,161	43,638,703	45,976,522
Cost of supplies and stocks on hand.....	23,806	9,000	1,214,735	1,247,541	23,132	3,632	1,669,549	1,696,313
Cash, trading and operating accounts and bills receivable.....	29,181	.....	5,422,518	5,451,699	27,011	811	6,825,741	6,853,563
Total.....	2,011,923	259,000	28,911,429	31,182,352	1,990,801	401,604	52,133,993	54,526,398

Table 219.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					\$	\$	\$
Ontario.....	15	2	114	131	13,720	95,145	103,865
Saskatchewan.....	1	1	27	29	1,500	36,165	37,665
Alberta.....	63	13	882	958	141,380	1,628,715	1,770,095
Canada.....	79	16	1,023	1,118	156,600	1,760,025	1,916,625
1929							
Ontario.....	14	1	119	134	11,753	91,766	103,519
Saskatchewan.....	4	.....	41	45	2,070	72,270	74,340
Alberta.....	160	54	1,828	2,042	369,667	3,201,163	3,570,830
Canada.....	178	55	1,988	2,221	383,490	3,365,199	3,748,689

*See note page 37.

Table 220.—Wage-Earners in the Petroleum Industry in Canada, by Provinces and by Months, 1928 and 1929

Month	1928				1929			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
January.....	109	1	537	647	107	21	780	908
February.....	109	1	588	698	107	7	769	883
March.....	109	1	581	691	107	7	793	907
April.....	106	6	682	794	109	39	1,008	1,156
May.....	110	20	858	988	117	31	1,331	1,479
June.....	113	27	898	1,038	120	15	1,698	1,833
July.....	110	27	917	1,054	115	15	1,811	1,941
August.....	113	27	963	1,103	113	15	2,027	2,155
September.....	107	27	907	1,041	107	24	2,040	2,171
October.....	108	27	918	1,053	105	24	2,058	2,187
November.....	102	27	871	1,000	99	15	1,946	2,060
December.....	101	22	863	986	98	9	1,658	1,765

2. The Petroleum Products Industry in Canada

Fifteen plants in Canada were engaged during 1929 in the refining of oils for the production of gasoline, kerosene, lubricating oils, waxes and petroleum coke. These Canadian refineries were located at strategic points across the Dominion for convenience in marketing their products. During 1929 these plants treated about 37.3 million gallons of oil from Canadian wells (including naphtha from the Turner Valley field in Alberta), and 1,035 million gallons of imported oils, obtained chiefly from the United States, Colombia and Peru. Gasoline production totalled 436.6 million gallons, including 132.6 million gallons made by the cracking process. Sales of fuel and gas oils amounted to 387 million gallons; in addition to which the refiners used 61.6 million gallons for fuel purposes. Fuel and gas oils made and used in the pressure cracking process was reported at 351 million gallons.

Ten plants in Canada were engaged during 1929 in compounding lubricating oils and greases. The total production of these plants was valued at \$1,024,134.

In the separation and purification of the various products obtained by the refineries in the treatment of crude oil, large quantities of sulphuric acid, caustic soda, and other chemical pro-

ducts are used. It appears that the consumption of 66°Bé. sulphuric acid in petroleum refining is approximately one pound of acid to six gallons of crude oil; for caustic soda, the average seems to be about one pound to 100 gallons of oil. The consumption of containers, cooperage stock, etc., reaches large figures annually, even though some shipping containers used for oil are returnable. The total cost of materials used in manufacturing in 1929 was \$76,861,939.

Capital employed in Canada's petroleum refining and blending industry in 1929 totalled \$71,260,459. Salaries and wages paid to the 4,978 salaried employees and wage-earners during the year amounted to \$8,153,625. The total value of the output of this industry was \$99,408,314.

Table 221.—Materials Used and Products Made by the Oil Refineries of Canada, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
MATERIALS USED—		\$		\$		\$
Petroleum refining—						
Crude oil, product of Canadian wells..... imp. gal.	15,632,271	1,783,413	20,324,814	2,112,314	37,338,402	4,026,272
Crude oil, imported..... imp. gal.	700,737,619	47,376,673	829,608,956	50,952,144	1,035,490,094	68,082,715
Imported fuel and gas oils for use in cracking process..... imp. gal.					440,475	18,270
Sulphuric acid (66° Bé) (Not made by firm reporting)..... lb.	49,728,504	407,894	51,828,643	408,905	49,610,612	425,853
Sulphur (not used in acid manufacture)..... lb.	145,980	4,498	161,044	5,105	201,032	6,770
Caustic soda..... lb.	3,798,427	147,684	4,345,466	159,803	6,699,874	243,319
Soda ash..... lb.	412,489	8,594	381,196	8,023	404,185	9,315
Litharge..... lb.	473,785	48,714	659,882	57,527	799,464	69,698
Fullers' earth..... lb.	8,304,713	80,611	11,707,839	109,221	18,513,820	207,931
Other materials.....		691,442		860,055		758,246
Shipping containers.....		2,194,007		2,360,088		2,440,793
Total.....		52,743,530		57,033,185		76,289,182
Lubrication oils and greases—Total.....				350,656		572,757
Grand total.....				57,383,841		76,861,939
PRODUCTS MADE—						
Petroleum refining—						
Made for sale—						
Gasoline (a) straight run..... imp. gal.	184,793,169	24,553,479	226,904,777	33,574,295	303,911,713	43,250,498
(b) by cracking process..... imp. gal.	73,722,859	10,614,360	117,175,542	18,647,134	132,646,696	20,242,805
Fuel and gas oils..... imp. gal.	239,272,246	11,394,422	309,185,187	12,543,505	387,069,829	15,586,290
V.M. & P. or solvent naphtha..... imp. gal.	6,195,040	720,360	4,949,743	643,350	7,259,910	974,348
Kerosene..... imp. gal.	54,287,118	6,617,819	55,939,530	7,335,353	49,297,417	6,870,711
Lubricating oils..... imp. gal.	18,514,655	3,431,326	19,022,749	3,340,097	22,900,238	3,943,418
Grease..... lb.	11,098,402	239,778	14,439,030	266,590	17,042,195	316,848
Tar..... lb.					1,032,500	8,260
Asphalt..... imp. gal.	21,800,573	2,287,139	22,326,606	2,016,630	35,233,347	2,688,579
Petroleum coke..... tons	69,379	403,555	80,361	467,548	84,108	465,753
Wax and candles..... lb.	2,525,909	505,125	15,872,946	599,335	10,776,352	537,886
Other products.....		464,787		368,915		258,113
Total for sale.....		61,232,150		79,802,752		95,143,509
Made for own use:—						
Gasoline (a) straight run..... imp. gal.	25,209	3,514	49,542	7,413	62,205	8,813
(b) by cracking process..... imp. gal.	8,487	1,995				
Fuel and gas oils (except for cracking)..... imp. gal.	47,253,487	2,189,990	52,206,663	1,907,829	61,629,931	2,308,963
V.M. & P. or solvent naphtha..... imp. gal.	10,498	1,258	9,728	1,376	11,371	1,490
Kerosene..... imp. gal.	28,961	3,594	42,389	5,191	64,964	8,763
Lubricating oils..... imp. gal.	17,417	3,117	26,297	3,884	24,960	4,191
Petroleum coke..... tons	6,850	45,663	15,547	93,882	25,408	140,230
Still gas..... M cu. ft.	1,719,394	450,301	2,489,346	572,847	3,140,187	708,781
Acid sludge.....		48,267		53,218		53,909
Other products.....						5,531
Total for own use.....		2,747,699		2,645,640		3,240,671
Total Petroleum refining.....		63,979,849		82,448,392		98,384,180
Fuel and gas oils made and used in pressure cracking process..... imp. gal.	189,962,745		284,510,884		351,436,512	
Lubricating oils and greases—						
Lubricating oils..... imp. gal.	1,059,225	375,840	1,244,350	464,613	1,522,045	745,876
Lubricating greases..... lb.	424,243	67,668	657,708	82,269	688,384	92,004
Soaps..... lb.		58,344		70,859	465,064	66,395
Other products.....		47,119		56,039		119,859
Total lubricating oils and greases.....		548,971		673,780		1,024,134
Grand total.....		64,528,820		83,122,172		99,408,314

CHAPTER EIGHT

THE NON-METAL MINING INDUSTRIES IN CANADA. (Other than Fuels)

Including detailed data relating to operations in the following industries:—

Abrasives	Miscellaneous—	Manganese, bog
Asbestos	Actinolite	Mineral waters
Feldspar	Barytes	Natro-alunite
Graphite	Bituminous sands	Phosphate
Gypsum	Fluorspar	Pyrites
Iron oxides	Lithium minerals	Silica brick
Mica	Magnesite	Sodium carbonate
Quartz	Magnesium sulphate	Sodium sulphate
Salt		
Talc and soapstone		

THE ABRASIVES INDUSTRY IN CANADA

The abrasives industry in Canada includes two main divisions: (1) The natural abrasives industry, covering the production of natural abrasives such as grindstones, pulpstones and scythestones, corundum, diatomite, volcanic dust, etc.; and (2) The artificial abrasives and abrasive products industry which covers the manufacture of silicon carbide, fused alumina, abrasive wheels, abrasive paper, etc.

(1) Abrasives, natural

This group of industries includes the production of corundum, diatomite, garnets, grinding pebbles, grindstones, pulpstones and scythestones, and volcanic dust.

Corundum.—Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. The industry made its appearance in these areas in 1900 and production reached a maximum in 1906. In 1921, grain corundum amounting to 403 tons valued at \$55,965 was exported to the United States, since that year no shipments of corundum have been reported.

Diatomite.—Prior to 1928 the Canadian production of diatomite was obtained from deposits in the province of Nova Scotia. In 1896, shipments of diatomite totalling 644 tons were made; this was the first official record of production in Canada. Deposits at Silica lake and near St. Ann's, Cape Breton, have been worked. This company's shipments prior to 1927 were made from deposits located in the vicinity of Silica lake, Colchester county. The diatomite was calcined in rotary furnaces before shipment to a plant at Haverstraw, New York. Development work was carried on during 1926 in connection with a diatomite deposit at East New Annan, Nova Scotia and in 1927 shipments of diatomite amounting to 266 tons were made.

In 1929 shipments of diatomite amounted to 429 tons valued at \$10,330. These shipments were made from deposits at East New Annan, Nova Scotia, and Quesnel, British Columbia.

Diatomite, sometimes called tripolite, is a silicious fossil material closely related to quartz in composition and is used principally for heat and sound insulation, as an absorbent, a filtering medium, a filler, a mild abrasive, and as a structural material.

Garnets.—A deposit of garnets in Ashby township, Ontario, was operated during 1923 and 1,250 tons of garnet concentrates and crude garnets were shipped to Niagara Falls, New York, for use as an abrasive material. In 1924, a shipment of 360 tons of garnets was made but there has been no production from this deposit since that date. In 1927, development work was done on a garnet deposit in Joly township, Labelle county, Quebec, and a shipment of 2 tons was made. During 1929, garnet deposits in Bauden, Joly and Trevet townships, Quebec, were being developed.

Grinding Pebbles.—Grinding pebbles have been obtained for a number of years along the shore of Lake Superior, near Jackfish, Ontario. During 1920 the production amounted to 560 tons; in 1925 the total was 105 tons; and in 1926 shipments were considerably lower, amounting to only 64 tons. Since 1926 there was no production of grinding pebbles in Canada.

The Hedley Gold Mining Company used pebbles obtained from Hedley, Similkameen district, British Columbia, in 1922. These pebbles were produced at a cost of \$4 per ton as compared with \$35 per ton for the imported Danish pebbles.

Grindstones, Pulpstones and Scythestones.—In Nova Scotia at Lower Cove near Joggins and at Minudie, grindstones were produced as early as 1750. Production from these quarries is reported to have been over 4,000 tons annually for a number of years around 1850. In 1873 shipments from Minudie amounted to 1,590 tons and in the following year the output from Lower Cove was 750 tons valued at \$12,000; and from Shore Cove 350 tons worth \$4,200.

Sandstone deposits near Pictou and Merigomish Harbour were operated between 1840 and 1865. The Mic Mac Quarry, east of Woodburn, produced grindstones up to 1927. This quarry averaged 300 tons annually from 1913 to 1926. The majority of the stones were shipped to the United States for saw and machine knife grinding.

Quarry Island has been the scene of operations for 60 years, and during the period 1870 to 1914 a production of 200 tons to 300 tons was recorded annually. However, since that time only a small quantity has been shipped each year.

In New Brunswick considerable activity was evidenced in this industry on Grindstone Island during the period 1800-1850, but since the latter date no shipments appear to have been made. From 1835 to 1885, a large number of quarries were operated in the southern part of the peninsula, between Petitcodiac and Memramcook rivers. These grindstones were exported mainly to the United States for file and spring grinding purposes. The Beaumont quarry was opened up in this district in 1899 and was closed down in 1919. In 1923, the Rockland quarry situated north of the Beaumont was opened up and since then some experimental shipments have been made.

Grindstone production started at Rockport, New Brunswick in 1815. Practically all of the stones cut since 1890 were sent to the Wood Point Plant in crude form for finishing. Prior to 1880, a small quantity of grindstones was produced from the sandstone reefs near Wood Point. From 1896 to 1906, production from these quarries ranged between 200 tons and 300 tons annually, which was increased to 800 tons to 1,000 tons during the next ten years. There have been no grindstones produced here since 1918.

In Northumberland county the production of grindstones commenced in 1870. Quarries have been operated at various points near Newcastle, but, with the introduction of Ohio stones on the New England markets operations were curtailed and only the Miramichi, Read and Fish quarries remained active.

New Brunswick grindstone quarries in operation in 1871 employed 200 men earning \$30,635 and made \$40,953 worth of products. In 1881 eight quarries were operated, seven in Gloucester county and one in Westmoreland, with a capital investment of \$10,250; a payroll of 136 men receiving \$20,975 in wages and a production valued at \$30,297. The high record for the industry, according to available information, was reached in 1907 when 4,833 tons were produced.

About 1830 the grey sandstones on the east side of Grindstone Island, the centre island of the Magdalen group in Quebec were worked by the French inhabitants and grindstones made for local use.

Some grindstones and scythestones have been shipped from sandstone deposits in Clara and Nottawasaga townships, Ontario. Shipments from the former township were made between 1870 and 1875 and from the latter between 1860 and 1870.

A sandstone quarry situated on Newcastle Island about one mile northeast of Nanaimo, British Columbia commenced shipping pulpstones in 1923. These stones are mainly of smaller sizes, although a few magazine grinders have been produced.

Volcanic Dust.—The extensive beds of volcanic dust that occur near Waldeck, 11 miles northeast of Swift Current, were first discovered in 1918. Shipments have been made from these deposits annually for the past six years. During 1929, production amounted to 300 tons valued at \$6,000.

Volcanic dust is used for purposes similar to ground pumice, particularly in the manufacture of cleansers and scouring powders and in some instances as a substitute for fuller's earth in the refining of hard oils and fats. The domestic market is not large, nevertheless, only about 2 per cent is supplied by the home product.

Table 222.—Capital Employed in the Natural Abrasives Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	339,166	631,639
Cost of supplies and stocks on hand.....	58,253	72,785
Cash, trading and operating accounts and bills receivable.....	51,199	86,367
Total.....	448,618	790,791

Table 223.—Wage-Earners in the Natural Abrasives Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	10	83	July.....	180	213
February.....	10	94	August.....	158	189
March.....	12	97	September.....	109	158
April.....	40	109	October.....	83	135
May.....	126	175	November.....	72	76
June.....	158	176	December.....	90	22

Table 224.—Production of Corundum in Canada, 1900-1929

(Short tons)

Year	Corun- dum- bearing rock treated	Grain corun- dum graded	Per cent recovery	Shipments of grain corundum				Average price in cents per pound
				Sold in Canada	Exported	Total ship- ments	Total value	
				Tons	Tons	Tons	\$	
1900.....		60.....		3.....		3.....	300.....	5-00.....
1901.....	4,134	434	10-7	85	302	387	46,415	5-97
1902.....	7,996	805	10-1	106	662	768	84,465	5-49
1903.....	(a) 8,877	839	9-5	85	618	703	77,510	5-51
1904.....	28,187	1,654	5-9	116	877	993	109,545	5-51
1905.....	23,571	1,681	7-1	140	1,504	1,644	149,153	4-48
1906.....	45,719	2,914	6-4	162	2,112	2,274	204,973	4-50
1907.....	60,532	2,682	4-4	164	1,728	1,892	177,922	4-70
1908.....	2,678	105	4-0	99	990	1,089	100,398	4-60
1909.....	35,894	1,579	4-4	129	1,362	1,491	162,492	5-45
1910.....	37,183	1,686	4-5	106	1,764	1,870	198,680	5-31
1911.....	41,975	1,641	3-9	92	1,380	1,472	161,873	5-50
1912.....	36,879	1,620	4-4	63	1,897	1,960	239,091	6-10
1913.....	12,290	763	6-2	23	1,154	1,177	137,036	5-82
1914.....	12,111	695	5-7	14	534	548	72,176	6-59
1915.....	1,724	116	6-7	21	241	262	35,138	6-33
1916.....	1,864	67	3-6	8	59	67	10,307	7-65
1917.....	4,659	188	4-0	16	172	188	32,153	8-55
1918.....	3,184	137	4-3	.....	137	137	26,112	9-90
1919.....	1,300	26	2-0	.....	.....	.....	.....	.....
1920.....	(b) 13,025	322	2-5	20	176	196	24,547	6-25
1921.....	(b) 11,256	407	3-6	.....	403	403	55,965	6-94
1922-1929.....								
Total.....	395,038	20,422	.....	1,452	18,072	19,524	2,104,251	.....

(a) In addition to this amount which was milled in Canada, 267 tons of ore were mined and shipped to the United States for treatment there.

(b) Tailings only.

Table 225.—Production of Diatomite in Canada, 1896-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1896.....	644	9,960	1907.....	30	225	1919.....	555	11,300
1897.....	15	150	1908.....	30	195	1920.....	260	8,600
1898.....	1,017	16,660	1909.....			1921.....	341	11,268
1899.....	1,000	15,000	1910.....	22	134	1922.....	219	5,781
1900.....	336	1,950	1911.....	20	122	1923.....	130	3,250
1901.....	850	15,300	1912.....	38	230	1924.....	33	898
1902.....	1,052	16,470	1913.....	620	12,138	1925-1926.....		
1903.....	835	16,700	1914.....	650	13,000	1927.....	266	6,650
1904.....	320	6,400	1915.....	317	12,119	1928.....	368	8,960
1905.....	300	3,600	1916.....	620	12,139	1929.....	429	10,330
1906.....			1917.....	600	18,000			
			1918.....	500	12,600	Total.....	12,427	249,969

Table 226.—Production of Grindstones in Canada, by Provinces, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Nova Scotia		New Brunswick		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	211	8,440	2,051	65,679	2,262	74,119
1921.....	183	6,990	881	33,647	1,064	40,637
1922.....	102	3,692	735	26,600	837	30,292
1923.....	254	7,906	1,463	43,577	1,717	51,483
1924.....	338	12,525	1,693	56,586	2,031	69,111
1925.....	439	16,723	1,296	45,061	1,735	61,784
1926.....	311	15,136	1,202	43,850	1,513	58,986
1927.....	11	220	1,306	47,255	1,317	47,475
1928.....			1,250	45,901	1,250	45,901
1929.....	6	110	1,032	37,291	1,038	37,401

Table 227.—Production of Pulpstones, Sharpening Stones, and Polishing Grit in Canada, 1920-1929

(For the years 1892 see Mineral Production of Canada 1928)

Year	Pulpstones		Sharpening stones		Polishing grit	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	125	10,000	56	3,987	1	30
1921.....	200	22,000	17	1,430		
1922.....	150	12,000	18	1,450		
1923.....	260	25,100	35	3,500		
1924.....	624	58,113	36	3,600		
1925.....	781	57,781	46	4,600		
1926.....	1,155	89,541	27	2,700		
1927.....	911	75,242	23	2,300		
1928.....	581	52,659	24	2,400		
1929.....	754	62,336	155	6,617		

Table 228.—Production of Grindstones, Pulpstones and Scythestones in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Nova Scotia.....	11	230			6	110
New Brunswick.....	1,860	97,197	1,609	80,451	1,731	103,514
British Columbia.....	380	27,600	246	20,509	210	2,730
Total.....	2,251	125,017	1,855	100,960	1,947	106,354

Table 229.—Imports into Canada and Exports of Abrasives, 1927-1929

Item	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
IMPORTS—						
Abrasives—						
Artificial abrasives in bulk, crushed or ground, when imported for use in the manufacture of abrasive wheels and polishing composition.....		216,174		244,771		251,704
Carborundum wheels or stones not further manufactured than moulded and burned.....		131,428		222,386		219,475
Diamond dust or bort, and black diamonds for borers.....		1,396,122		2,281,249		2,727,285
Diatomaceous earth or infusorial earth (Kieselguhr) ground or unground (from April 1, 1928).....			5,354	9,594	23,857	40,539
Emery in bulk, crushed or ground.....		46,649		53,289		54,433
Emery wheels and carborundum wheels, n.o.p.....		56,916		109,185		133,779
Emery or carborundum, manufactures of, including carborundum stones, n.o.p.....		76,987		83,942		99,036
Grindstones, not mounted, and not less than 36 inches in diameter.....		815,257		612,792		424,613
Grindstones, n.o.p.....		96,451		40,598		23,769
Pumice and pumice stone, lava and calcareous tufa, not further manufactured than ground.....		35,211		48,062		35,955
Sand paper, glass, flint and emery paper or emery cloth.....		348,652		423,357		498,328
Iron sand or globules for polishing and sawing.....		12,052		18,110		41,934
Burrstones in blocks, rough or unmanufactured, not bound up or prepared for binding into mill-stones..... No.	3	450	119	95	30	1,310
Total		3,232,349		4,148,260		4,552,160
EXPORTS—						
Grindstones, manufactured.....		50,866		28,747		36,536
Abrasives—						
Natural, n.o.p..... cwt.	5,516	6,426	5,871	7,071	8,287	9,757
Artificial, crude, including carborundum..... cwt.	1,000,321	2,645,347	1,235,302	3,295,460	1,571,816	3,815,804
Artificial, made up into wheels, stones, etc.....		38,463		63,745		53,666
Total		2,741,102		3,395,023		3,915,763

2. Abrasives, Artificial and Abrasive Products.

Manufactures of artificial abrasives and abrasive products in Canada amounted in value to \$8,961,951 in 1929. This was an increase of 26 per cent over the corresponding selling value for 1928. The principal products were fused alumina, 53,857 tons worth \$4,974,789; crude silicon carbide, 21,592 tons valued at \$2,577,033; and abrasive wheels valued at \$819,884. Other products were ferrosilicon, abrasive cloth and paper, firesand and sharpening stones.

For 1929 reports were received from 12 plants of which 11 were in Ontario and 1 in Quebec. Capital employed amounted to \$6,683,533 distributed as follows: cost of lands, buildings, equipments, etc., \$4,166,186; supplies and stock on hand, \$1,331,556; cash trading and operating accounts and bills receivable, \$1,185,791. The average number of employees was 828 and salaries and wages for the year totalled \$1,270,898. Materials used in manufacturing cost \$2,905,928 at the works, and the value added by manufacturing processes was \$6,056,023.

ASBESTOS

Asbestos was discovered in the Des Plantes river region, between St. Joseph and St. Francis villages, Quebec, about 1862. Operation of these deposits was found, however, to be unprofitable owing to their limited character.

The next discovery of asbestos was made in the district of Thetford and Coleraine in 1877. In the following year mining was commenced on a small scale and some fifty tons were produced. The fibre produced was excellent but it was difficult to find a market.

In the course of the next twelve years developments in the industry were rapid. Seven quarries were in operation in 1885 and the exports during that year totalled 2,440 tons. First quality asbestos sold for \$80 per ton; however, a gradual increase in price was recorded and in 1900 when the total production was 29,141 tons this grade brought \$300 per ton. Production in 1910 advanced to 102,215 tons; employees numbered 3,693 with total wages of \$1,528,544. In 1920, there were 18 mines in operation, the quantity sold was 199,573 tons valued at \$14,792,201 employees totalled 3,572 and wages paid were \$4,765,305.

Canada, the world's leading asbestos producer, attained a new high record, in the production of this mineral during 1929. Shipments for the year amounted to 306,055 tons valued at \$13,172,581, an increase of 12.1 per cent in quantity and 17.2 per cent in value as compared with the production of the previous year. The average value received by the seven operating firms was \$43.04 per ton as compared with \$41.16 in 1928. Asbestos rock mined during the year totalled 6,208,970 tons of which 4,384,120 tons were milled.

Production of asbestos increased in Rhodesia, South Africa and in the United States during 1929. The output from deposits in Rhodesia totalled 42,634 tons, from South Africa, 33,024 tons, and from the United States, 3,155 tons; a decrease was recorded in the production from Cyprus.

Twelve plants in Canada manufactured asbestos products including paper and mill board, asbestos roofing of all kinds, asbestos rigid shingles, asbestos building materials, asbestos cellular and sponge-felted pipe insulation, insulating sheets and blocks, asbestos brake linings and clutch facings (woven on special looms), and asbestos packings for steam, oil and hydraulic operations. In 1929 production from these plants was valued at \$2,286,638.

Table 230.—Production of Asbestos in Canada, 1920-1929

(For the years 1880 to 1919 see Mineral Production of Canada, 1928)

Year	Short tons	Value	Year	Short tons	Value
		\$			\$
1920.....	199,573	14,792,201	1925.....	273,524	8,977,546
1921.....	92,761	4,906,230	1926.....	279,403	10,099,423
1922.....	163,706	5,552,723	1927.....	274,778	10,621,013
1923.....	231,482	7,522,506	1928.....	273,033	11,238,360
1924.....	225,744	6,710,830	1929.....	306,055	13,172,581

Table 231.—Mill Output and Shipments of Canadian Asbestos, 1928 and 1929

Classification	1928				1929			
	Total output	Sold or shipped			Total output	Sold or shipped		
		Quantity	Total sales value at mill	Average value per ton		Quantity	Total sales value at mill	Average value per ton
Tons	Tons	\$	\$	Tons	Tons	\$	\$	
Crude No. 1.....	706	893	477,640	534.87	883	802	447,259	557.68
Crude No. 2.....	2,784	2,757	818,174	296.76	2,864	2,625	870,888	331.77
Other crudes.....	507	516	65,868	127.65	1,053	931	168,226	180.69
Spinning stocks.....	14,051	13,570	2,017,884	148.70	19,615	17,545	3,110,848	177.31
Shingle stocks.....	41,975	34,961	2,580,160	73.80	34,038	34,177	2,572,216	75.26
Mill board and paper stocks....	71,141	78,443	3,038,227	38.73	91,892	91,157	3,515,209	38.56
Fillers, floats and other short fibres.....	142,701	141,893	2,240,407	15.79	160,859	158,818	2,487,935	15.66
Total.....	273,865	273,033	11,238,360	41.16	311,204	306,055	13,172,581	43.04
Sand and gravel*.....	23,441	22,787	13,469	0.59	18,976	18,976	7,303	0.33

*This production has been included under the "Sand and Gravel Industry."

Table 232.—Imports of Asbestos into Canada, 1927-1929

Item	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
Asbestos in any form other than crude, and all manufactures of, n.o.p.....		\$		\$		\$
Asbestos packing.....	114	562,794	101	727,843	113	897,229
		109,088		108,044		116,207
Total.....		671,882		835,887		1,013,436

Table 233.—Exports of Canadian Asbestos by Countries of Destination, 1927-1929

Commodity and Destination	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$				\$
ASBESTOS—						
Great Britain.....	11,673	818,858	6,886	547,250	3,508	350,410
United States.....	75,930	4,706,247	80,765	5,157,955	91,876	6,033,946
Australia.....	1,697	119,965	1,390	104,275	1,463	137,087
Belgium.....	8,068	540,655	3,841	309,149	14,291	987,896
France.....	5,486	409,840	7,012	505,825	6,583	504,539
Germany.....	16,317	1,223,768	13,589	1,153,177	11,329	1,189,580
Italy.....	3,687	246,633	3,431	296,148	2,424	234,971
Japan.....	7,553	402,075	9,165	507,758	10,557	567,800
Netherlands.....	2,533	209,290	2,464	168,289	1,240	87,210
Spain.....	22	1,210	431	33,055	92	6,560
Other countries.....	259	18,835	218	19,677	362	27,209
Total.....	133,225	8,697,376	129,192	8,802,558	143,725	10,127,208
SAND AND WASTE—						
Great Britain.....	2,823	65,479	1,964	40,727	2,335	55,850
United States.....	120,378	1,830,728	126,417	1,960,491	140,588	2,320,084
Germany.....	3,512	73,173	3,460	84,950	2,667	66,625
Netherlands.....	2,203	46,939	1,988	48,900	1,201	30,025
Other countries.....	1,149	21,616	1,900	42,661	1,514	34,890
Total.....	130,065	2,037,935	135,729	2,177,729	148,305	2,507,474
ASBESTOS MANUFACTURES INCLUDING ASBESTOS ROOFING—						
Great Britain.....		7,479		7,738		58,769
United States.....		18,599		22,711		21,556
British South Africa.....		831				
Newfoundland.....		5,383		5,765		4,707
New Zealand.....		859		1,571		592
Other countries.....		33,183		28,110		28,328
Total.....		66,334		65,895		113,952

Table 234.—Monthly Average Prices of Asbestos by Grades, 1928 and 1929

(Per short ton)

(Computed from quotations in the *Engineering and Mining World*)

Month	Crude No. 1	Crude No. 2	Spinning fibres	Magnesia and compressed sheet fibres	Shingle stock	Paper stock	Cement stock	Short fibres	Floats
	\$	\$	\$	\$	\$	\$	\$	\$	\$
1928									
January.....	650	450	212	168	100	48	25	15	15
February.....	650	450	212	168	90	48	25	15	15
March.....	650	450	212	170	90	48	25	15	15
April.....	650	400	212	168	90	48	25	15	15
May.....	625	388	208	168	85	48	25	15	15
June.....	625	388	208	168	85	48	25	15	15
July.....	625	388	208	168	85	48	25	15	15
August.....	625	388	208	168	85	48	25	15	15
September.....	625	388	208	168	85	48	25	15	15
October.....	625	388	208	168	85	48	25	15	15
November.....	625	388	208	168	85	48	25	15	15
December.....	625	388	208	168	85	48	25	15	15
Average.....	633	406	209	168	88	48	25	15	15
1929									
January.....	650	512	250	200	85	47	25	15	13
February.....	650	512	250	200	85	47	25	15	13
March.....	650	512	250	200	85	47	25	15	13
April.....	650	512	250	200	85	47	25	15	13
May.....	650	512	250	200	85	47	25	15	13
June.....	650	512	250	200	85	47	25	15	13
July.....	650	512	250	200	85	47	25	15	13
August.....	650	512	250	200	85	47	25	15	13
September.....	650	512	250	200	85	47	25	15	13
October.....	650	512	250	200	85	47	25	15	13
November.....	650	512	250	200	85	47	25	15	13
December.....	650	512	250	200	85	47	25	15	13
Average.....	650	512	250	200	85	47	25	15	13

Table 235.—Capital Employed in the Asbestos Industry in Canada, 1927-1929

	1927	1928	1929
	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—			
Cost of lands, buildings, machinery and tools.....	30,837,295	32,262,729	29,776,658
Cost of supplies and stocks on hand.....	1,686,084	1,850,799	1,893,501
Cash, trading and operating accounts and bills receivable.....	2,793,442	1,501,684	1,578,798
Total.....	35,316,821	35,705,212	33,248,957

Table 236.—Employees, Salaries and Wages in the Asbestos Industry in Canada, 1928 and 1929

	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried Employees.....	128	19	147	372,070	172	25	197	419,799
Wage-Earners—								
Mine.....	1,739		1,739		1,835		1,835	
Mill.....	1,284		1,284		1,359		1,359	
Total.....	3,023		3,023	3,617,574	3,194		3,194	3,990,736
Grand total.....	3,151	19	3,170	3,989,644	3,366	25	3,391	4,410,535

Table 237.—Wage-Earners in the Asbestos Industry in Canada by Months, 1928 and 1929

Month	1928		1929		Month	1928		1929	
	Mine	Mill	Mine	Mill		Mine	Mill	Mine	Mill
January.....	1,514	1,219	1,491	1,095	July.....	1,670	1,306	1,931	1,441
February.....	1,553	1,165	1,659	1,168	August.....	1,779	1,352	1,912	1,451
March.....	1,595	1,170	1,761	1,294	September.....	1,886	1,435	1,944	1,499
April.....	1,578	1,171	1,733	1,271	October.....	1,924	1,409	1,947	1,454
May.....	1,652	1,199	1,816	1,400	November.....	1,914	1,388	1,957	1,457
June.....	1,733	1,258	1,867	1,388	December.....	1,856	1,308	1,943	1,434

Table 238.—*World Production of Asbestos, 1925-1929

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada ¹	259,275	249,467	245,337	243,780	273,264
Southern Rhodesia ²	30,669	29,771	29,221	35,679	38,066
Union of South Africa ²	9,078	13,884	21,004	24,197	28,717
Australia ²	51	109	11	5	255
Cyprus ² (exports).....	3,221	6,313	11,380	16,287	14,110
India ²	16	80	68	157	318
Total.....	302,310	299,624	307,421	320,105	354,730
FOREIGN COUNTRIES					
China ²	213	(a)	(a)	(a)	(a)
Finland ³	1,700	2,133	2,385	2,241	1,538
Italy ²	2,071	2,500	4,470	4,724	(a)
Russia ²	10,000	18,044	20,822	26,000	(a)
United States ³	1,123	1,213	2,662	1,999	2,817
France ²	654	650	790	(a)	(a)
Japan ²	1,155	1,000	1,000	1,000	1,000
Total.....	16,916	25,540	32,129	35,964	5,355
Grand total.....	319,226	325,164	339,550	356,069	360,085

*Source—

¹Dominion Bureau of Statistics, Canada.²Imperial Institute publications.³Mineral Resources of the United States.

(a) Data not available.

FELDSPAR

The first record of production in the feldspar industry in Canada dates back to about the year 1890. The production during that year was approximately 700 tons and since that date an increase has been recorded until in 1924 the maximum output for the industry, namely, 44,804 tons, was produced.

Feldspar production in Canada during 1929 increased 17.6 per cent in quantity and 19.5 per cent in value over the totals for 1928. The 1929 production was 37,527 tons valued at \$340,471 as compared with shipments of 31,897 tons worth \$284,942 in the previous year.

All of the feldspar mined in Canada is of the potash variety known as orthoclase or microcline. Soda feldspar (albite) is known to occur, but there is little demand for this variety and none is mined.

The principal producing localities in 1929 were the Hybla, Perth, and Verona areas, in Ontario, and Aylwin township and the Buckingham area in Quebec. The last named came to the fore in 1921, when development work proved up several bodies of exceptionally good feldspar and resulted in a production of 10,000 tons from one quarry alone in that year. The Richardson mine, near Verona, Ontario, formerly an important producer but idle for many years, was re-opened during 1928.

The Kingston plant for the fine grinding of feldspar was in operation during 1929.

Exports of Canadian crude feldspar in 1929 totalled 29,896 tons appraised at \$242,915. These exports were principally to the United States. An increase of 24.7 per cent was recorded in the imports of feldspar into Canada in 1929. There were 19 firms reported as operating in Canada during the past year.

Table 239.—Production of Feldspar in Canada, by Provinces, 1920-1929

(For the years 1890-1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	649	10,052	37,224	270,843	37,873	280,895
1921.....	9,737	80,180	20,115	150,457	29,868	230,754
1922.....	12,472	127,826	15,255	120,576	27,727	248,402
1923.....	12,026	102,779	17,199	134,822	29,225	237,601
1924.....	16,147	142,118	28,657	216,422	44,804	358,540
1925.....	11,287	94,730	17,394	141,059	28,681	235,789
1926.....	13,168	111,136	22,783	199,102	35,951	310,238
1927.....	12,730	101,618	17,119	154,533	29,849	259,151
1928.....	12,943	104,789	18,954	180,153	31,897	284,942
1929.....	15,790	133,492	21,737	206,979	37,527	340,471

†Includes Nova Scotia production of 16 tons valued at \$117.

Table 240.—Production in Canada, Imports and Exports of Feldspar, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	12,730	104,618	12,943	104,789	15,790	133,492
Ontario.....	17,119	154,533	18,954	180,153	21,737	206,979
Total.....	29,849	259,151	31,897	284,942	37,527	340,471
IMPORTS.....	3,040	50,875	3,171	53,818	3,955	65,997
EXPORTS.....	28,648	225,955	28,101	230,945	29,896	242,915

Table 241.—Capital Employed in the Feldspar Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	146,489	116,005
Cost of supplies and stocks on hand.....	18,838	34,696
Cash, trading and operating accounts and bills receivable.....	72,073	72,742
Total.....	237,400	223,443

Table 242.—Employees, Salaries and Wages in the Feldspar Industry in Canada, 1928 and 1929

	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	7	1	8	14,172	5	4	9	19,936
Wage-earners.....	215	.....	215	130,488	200	.....	200	144,504
Total	222	1	223	144,660	205	4	209	164,440

Table 243.—Wage-Earners in the Feldspar Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	144	150	July.....	205	182
February.....	152	132	August.....	198	215
March.....	122	127	September.....	207	208
April.....	109	119	October.....	188	175
May.....	133	201	November.....	189	167
June.....	176	210	December.....	184	148

Table 244.—*World Production of Feldspar, 1925-1929

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom (b).....	57,379	47,769	63,612	61,579	64,558
Canada.....	25,608	32,099	26,651	28,481	33,506
Australia.....	32	122	108	161 (b)	78
Union of South Africa.....		99	29	29	
Total.....	83,019	80,089	90,400	90,250	98,142
FOREIGN COUNTRIES					
Czechoslovakia (estimated).....	(a)	30,000	30,000	30,000	30,000
Finland.....	788	800	643	700	(a)
France.....		18,951	15,000	(a)	(a)
Germany (Bavaria).....	10,093	6,553	7,204	6,132	7,574
Italy.....	2,500	5,785	3,990	4,882	(a)
Japan.....	18,743	(a)	(a)	(a)	(a)
Norway (Exports).....	26,355	20,181	27,213	23,894	26,104
Rumania.....		1,662	1,912	2,790	2,440
Russia (fiscal years Sept. 30th).....	8,477	20,629	19,019	(a)	(a)
Sweden.....	26,321	33,434	30,152	39,290	(a)
United States (sales).....	185,706	209,989	202,497	210,811	197,699
Total.....	278,983	347,984	337,630	318,499	263,817
Grand total.....	362,002	428,073	428,030	408,749	361,959

* Source—Imperial Institute publications.

(a) Data not available.

(b) Including China Stone.

GRAPHITE

The first operations in the graphite industry in Canada were carried on in the province of Quebec in 1846, when a deposit of crystalline graphite was worked in Grenville township. During 1869 an estimated value of \$72,000 was placed on shipments of graphite from New Brunswick and Quebec. Ten years later exports from Canada were valued at \$1,167. During the three-year period 1869-1871, a property in Buckingham township, Quebec was operated with an average production of 450 tons; employment was furnished 18 men during this period. From 1888 to 1899, operations were carried on intermittently in Buckingham township, however, from that date to 1906 little work was done on these deposits. In 1916, mills at Buckingham and St. Remi d'Amherst, shipped 479 tons.

Mining and milling of graphite in Ontario had its inception in 1870 when the Port Elmsley deposit was opened up and the Oliver's Ferry refining plant was constructed. A deposit in Bedford township was operated prior to 1890 and a small quantity of crystalline graphite was produced. In 1896 another producer commenced operations, namely, the Black Donald Company. This company's deposit is located near Calabogie in Renfrew county and is the largest and richest body of graphite known in North America. Operations have been practically continuous since the opening up of this property. The graphite is shipped as refined product, the higher grades which are used in lubricating compounds, being 90 to 99 per cent pure. These products are used principally in lubricants, foundry facings, stove polishes and in the manufacture of paints for iron and steel structural work. In 1919 the N. A. Timmins deposit in North Burgess township was opened up.

The demand for Canadian graphite during the war years had its peak in 1916 and the production in that year amounted to 3,955 tons valued at \$325,362. The six plants in operation employed 344 men, whose wages totalled \$191,876. Although the 1917 tonnage was 241 tons less than that of the preceding year, the value received by the operators was considerably higher, the total being, \$402,892. No. 1 flake graphite sold for an average of \$293.80 per ton in 1917; No. 2 flake, \$153.26 per ton; and amorphous and dust, \$57.30 a ton.

Table 245.—Production of Graphite in Canada, by Provinces, 1920-1929

(For production from 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	233	31,913	1,957	133,704	2,190	165,617
1921.....	38	2,423	899	63,439	937	65,862
1922.....	24	1,500	573	29,853	597	31,353
1923.....	45	2,316	1,068	65,557	1,113	67,873
1924.....	46	3,275	1,288	72,842	1,334	76,117
1925.....	359	30,900	2,210	127,863	2,569	158,763
1926.....	326	29,516	2,401	165,344	2,727	194,860
1927.....	34	2,043	1,795	109,613	1,829	111,656
1928.....	50	4,668	1,047	52,373	1,097	57,041
1929.....	173	12,652	1,288	90,522	1,461	103,174

Table 246.—Production in Canada, Imports and Exports of Graphite, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Ore milled.....	7,743	.....	392	.....	5,448	.....
Production.....	1,829	111,656	1,097	57,041	1,461	103,174
IMPORTS—						
Crucibles, plumbago.....		60,783		55,488		66,833
Plumbago, not ground or otherwise manufactured.....		1,457		4,023		6,546
Plumbago, ground and manufactures of, n.o.p.....		60,897		68,515		82,391
EXPORTS—						
Graphite or plumbago, crude or refined.....	1,699	102,476	1,053	45,384	1,582	88,647

Table 247.—*World Production of Graphite, 1925-1929

(Long tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada.....	2,294	2,435	1,633	940	1,304
Australia.....			10		50
Ceylon (exports).....	15,426	11,623	12,884	14,347	12,739
Tanganyika Territory.....				6	
Union of South Africa.....	47	46	57	50	52
India.....					39
Total.....	17,767	14,104	14,584	15,343	14,200
FOREIGN COUNTRIES					
Austria.....	12,868	14,523	17,773	23,843	24,897
Czechoslovakia.....	18,169	30,323	40,464	31,821	(a)
France.....	1,121	935	(a)	(a)	(a)
Germany.....	16,582	14,078	17,492	17,187	21,012
Italy.....	9,777	9,453	8,262	6,919	5,954
Norway.....					
Russia (years ended Sept. 30).....	1,277	6,304	6,749	1,867	(a)
Spain.....	1,914	593	346	(a)	(a)
Sweden.....					
Greenland.....			(a)		
Indo-China (French).....	218	801	405		(a)
Japan.....	994	491	623	435	(a)
Korea.....	13,852	15,504	17,600	22,124	24,751
Madagascar (exports).....	12,796	15,651	14,526	13,680	15,795
Mexico.....	5,745	4,364	5,745	4,894	5,630
United States (sales).....	4,165	4,884	4,649	5,010	5,766
Total.....	99,478	117,904	134,634	129,000	138,000
Grand total.....	117,245	132,008	149,218	144,000	152,000

(a) Information not available.

ARTIFICIAL GRAPHITE

Artificial graphite is manufactured in electric furnaces at Niagara Falls, Ontario, by the Acheson Graphite Company. The annual production over a period of fifteen years is shown in the following table:

Table 248.—Artificial Graphite made in Canada, 1914-1929

Year	Pounds	Year	Pounds	Year	Pounds
1915.....	497,271	1920.....	207,180	1925.....	1,291,311
1916.....	525,048	1921.....	376,508	1926.....	1,246,291
1917.....	1,006,172	1922.....	724,524	1927.....	1,187,011
1918.....	1,808,698	1923.....	1,554,376	1928.....	830,680
1919.....	358,524	1924.....	816,455	1929.....	1,149,920

GYPSUM

Gypsum production from Canadian deposits during 1929 amounted to 1,211,689 tons valued at \$3,345,696 as compared with the high record for the industry of 1,246,368 tons worth \$3,743,648 set up in 1928. Gypsum quarried during 1929 totalled 1,225,728 tons of which quantity 248,000 tons or 20.2 per cent was calcined in Canada.

Canadian production was obtained from quarries in Hants, Inverness, and Victoria counties, N.S.; Albert and Victoria counties, N.B.; near Paris, Ontario; Gypsumville, Manitoba; and in the Fort Steele, Kamloops and Clinton mining divisions, B.C.

Approximately 92 per cent of the Nova Scotia production was shipped as crude gypsum to the United States during 1929. Two plants were operated in this province for the calcining of gypsum. At Windsor, N.S., hardwall and selenite plasters were produced; these products were shipped to various points in the Maritime Provinces and some as far west as Montreal; shipments were also made to Newfoundland and New Zealand. A plant at Iona, N.S. produced plaster of Paris, hardwall plaster, stucco and dental plaster; the Maritimes, Quebec and Ontario provided the principal market for these products although some shipments were made to the United States and to New Zealand.

The New Brunswick output consisted of a very pure quality gypsum produced from deposits at Hillsborough. Hardwall, finishing and dental plasters were produced at Hillsborough and marketed throughout Canada and in the United States. Finishing plasters were also exported to New Zealand, Australia, South Africa, and the British West Indies. In addition to these products, shipments of crude gypsum were made to the United States. Small shipments of land plaster were made from a quarry at Plaster Rock, N.B.

Ontario's production consisted of crude and calcined gypsum produced at Caledonia and Lythmore.

In Manitoba crude gypsum was obtained from deposits at Gypsumville, 170 miles north of Winnipeg. This crude material was shipped to Winnipeg for processing.

British Columbia's production was extracted from quarries at Falkland, Mayook and Kelly Lake. Shipments from Mayook consisted of crude gypsum for use in the manufacture of cement. The Falkland gypsum was shipped to a gypsum products plants at Port Mann. Gypsum was obtained from several deposits located near Kelly Lake, on the Pacific Great Eastern Railway.

Exports of crude gypsum during 1929 amounted to 893,445 tons; this tonnage was shipped the United States. Ground gypsum and prepared wall plaster exported during the year totalled 7,938 tons and consisted of shipments principally to New Zealand, the United States, Newfoundland and Australia.

Table 249.—Annual Production of Gypsum in Canada, by Provinces, 1920-1929

(For the years 1874 to 1919 see Mineral Production of Canada, 1928)

Year	Nova Scotia		New Brunswick		Ontario		Manitoba		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$		\$		\$
1920..	260,661	573,752	49,405	428,183	74,707	404,162	44,371	487,894	.....	.....	429,144	1,893,991
1921..	206,831	511,883	54,030	360,220	84,790	433,053	40,859	480,282	40	100	386,550	1,785,538
1922..	332,404	580,148	82,462	517,668	110,227	621,668	34,072	440,914	100	500	559,265	2,160,898
1923..	341,705	747,934	104,740	564,680	99,958	542,317	31,575	386,554	323	1,615	578,301	2,243,100
1924..	441,752	915,845	86,738	476,804	88,121	467,097	29,375	348,212	30	150	646,016	2,208,108
1925..	551,230	1,070,408	71,745	408,917	82,020	491,833	35,088	417,868	240	865	740,323	2,389,891
1926..	678,107	1,187,918	59,546	468,411	89,987	496,059	35,172	461,461	20,916	156,964	883,728	2,770,813
1927..	829,438	1,512,015	85,293	524,550	83,998	500,688	39,895	512,008	24,493	201,754	1,063,117	3,251,015
1928..	1,013,257	1,850,243	75,033	501,252	85,811	553,271	51,285	609,039	20,982	229,843	1,246,368	3,743,648
1929..	948,895	1,152,160	70,482	485,982	100,347	832,689	67,269	631,051	24,696	243,814	1,211,689	3,345,696

Table 250—Summary of Statistics on Gypsum in Canada, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Crude gypsum mined.....	1,105,704		1,311,642		1,225,728	
Crude gypsum calcined.....	196,232		226,997		218,005	
PRODUCTION BY GRADES—						
Crude—						
Lump.....	225,264	371,488	43,224	80,467	44,848	90,071
Crushed.....	665,499	1,223,070	1,018,172	1,770,077	964,875	1,147,289
Fine ground.....	7,065	42,633	9,576	55,170	2,201	17,271
Calcined.....	165,289	1,613,824	175,396	1,837,934	199,765	2,091,065
Total.....	1,063,117	3,251,015	1,246,368	3,743,648	1,211,689	3,345,696
PRODUCTION BY PROVINCES—						
Nova Scotia.....	829,438	1,512,015	1,013,257	1,850,243	948,895	1,152,160
New Brunswick.....	85,293	524,550	75,033	501,252	70,482	485,982
Ontario.....	83,998	500,688	85,811	553,271	100,347	832,689
Manitoba.....	39,895	512,008	51,285	609,039	67,269	631,051
British Columbia.....	24,493	201,754	20,982	229,843	24,696	243,814
Total.....	1,063,117	3,251,015	1,246,368	3,743,648	1,211,689	3,345,696
IMPORTS—						
Gypsum, crude (sulphate of lime)*.....	1,092	42,741	1,097	40,312	1,244	18,671
Plaster of Paris, or gypsum ground not calcined.....	111	2,996	256	7,379	165	5,283
Plaster of Paris, or gypsum calcined and prepared wall plaster.....	7,016	101,823	10,563	142,550	16,356	189,438
Total.....	8,219	147,560	11,916	199,241	17,765	213,392
EXPORTS—						
Gypsum or plaster crude.....	588,808	959,858	824,536	1,240,987	893,445	1,086,939
Plaster of Paris, ground and prepared wall plaster.....	6,556	113,049	8,232	140,946	7,938	137,046
Total.....	595,364	1,072,907	832,768	1,381,933	901,383	1,223,985

* Consists of crown filler and anhydrous sulphate of lime.

Table 251.—Capital Employed in the Gypsum Industry in Canada by Provinces, 1928 and 1929

	1928			1929		
	Nova Scotia	New Ontario, Brunswick, Manitoba and British Columbia	Canada	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	4,440,028	2,019,119	6,459,147	3,822,349	2,415,357	6,237,706
Cost of all supplies and stocks on hand.....	417,152	220,728	637,880	396,096	279,878	675,974
Cash, trading and operating accounts and bills receivable.....	76,399	861,893	938,292	307,027	217,898	524,925
Total.....	4,933,579	3,101,740	8,035,319	4,525,472	2,913,133	7,438,605

Table 252.—Employees, Salaries and Wages in the Gypsum Industry in Canada, 1928 and 1929

	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	57	18	75	180,870	58	13	71	175,256
Wage-earners—								
Mine.....	733		733		622		622	
Mill.....	351		351		293	1	294	
Total.....	1,084		1,084	990,944	915	1	916	878,957
Grand total.....	1,141	18	1,159	1,171,814	973	14	987	1,054,213

Table 253.—Wage-Earners in the Gypsum Industry in Canada by Provinces and by months, 1929

Month	Nova Scotia		New Brunswick, Ontario, Manitoba and British Columbia		Canada	
	Mine	Mill	Mine	Mill	Mine	Mill
January.....	172	32	153	243	325	275
February.....	172	30	155	225	327	255
March.....	165	30	189	213	354	243
April.....	295	30	192	247	487	277
May.....	464	33	240	266	704	299
June.....	455	51	240	283	695	334
July.....	514	36	229	289	743	325
August.....	521	36	231	275	752	311
September.....	568	36	222	249	790	285
October.....	540	36	195	261	735	297
November.....	440	34	183	247	623	281
December.....	255	30	150	246	405	276

Table 254.—*World Production of Gypsum 1925-1929

(Long tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	414,529	465,191	506,350	634,645	967,491
Canada (shipments).....	661,003	789,043	949,211	1,112,829	1,081,592
Union of South Africa.....	7,123	(b) 11,029	15,187	14,637	16,973
Cyprus (shipments).....	24,193	17,677	15,139	(b) 11,426	12,555
Palestine.....			1,140	1,341	1,475
India.....	36,244	34,473	38,105	59,050	52,726
Australia.....	90,150	80,565	122,842	118,867	15,707
Total.....	1,233,242	1,397,978	1,647,974	1,952,795	2,150,000
FOREIGN COUNTRIES					
Austria (exports less imports).....	24,067	21,741	24,799	28,100	†50,000
Estonia.....	3,821	4,751	11,979	7,856	9,835
France.....	2,293,000	2,412,900	2,040,240	(a)	(a)
Germany (Bavaria).....	57,352	44,956	58,779	53,622	59,241
Greece.....	9,898	9,158	1,982		(a)
Italy (including alabaster).....	662,707	645,194	663,287	640,587	(a)
Jugoslavia (Serbia only).....		610	1,046	1,152	1,585
Luxemburg.....	24,556	33,447	7,724	2,466	7,092
Rumania.....	52,994	43,616	76,496	47,030	75,414
Russia (years ended Sept. 30).....	166,353	303,295	278,532	(a)	(a)
Spain (exports).....	2,958	719,816	896,950	1,037,368	(a)
Sweden.....		135	88	114	(a)
Algeria.....	71,700	72,408	72,000	76,349	101,394
United States.....	5,066,964	5,031,644	4,774,007	4,555,580	4,478,689
Argentina (exports).....	1,833	(a)	51,128	40,949	(a)
Chile.....	8,310	6,880	8,245	8,969	(a)
Peru.....	14,413	11,521	9,891	15,388	19,830
China (exports).....	6,984	3,721	2,431	3,214	3,098
Japan.....	152,736	260,803	74,306	67,433	(a)
Philippine Islands.....		381	(a)	(a)	(a)
Egypt.....			130,000	130,000	130,000
Total.....	8,620,646	9,626,977	9,200,000	9,100,000	(a)
Grand total.....	9,853,888	11,024,955	10,900,000	11,100,000	(a)

(a) Data not available.

(b) Shipments.

† Estimated.

IRON OXIDES

In 1851, an important deposit of ochre was worked at Pointe du Lac, St. Maurice county, Quebec, and shipments of dried ochre were made to the United States, subsequently this property was abandoned. Thirty-two years later the manufacture of dry ochre was commenced on a small scale in Iberville township on the Little Romaine river. This deposit was later abandoned but in 1916 it was re-opened and a small quantity of crude ochre was taken out for use as a pigment in the paper industry. A deposit was opened up at St. Malo, Champlain county, in 1885 and a calcining plant erected. Calcined ochre was shipped from this mill to Montreal where it was further prepared for use in the manufacture of paint.

Deposits of iron oxides in the Three Rivers district, Quebec, are important. The Canada Paint Company Limited, operates a large plant at Red Mill for calcining, washing and grinding pigments.

About 1½ miles east of Red Mill, the Champlain Oxide Company operated a calcining plant. No shipments have been made from this plant since 1923.

For a number of years Thos. H. Argall operated a calcining plant near the Champlain mill. Operations ceased, however, due to labour troubles and this producer opened up another deposit at Pointe-du-Lac from which crude iron oxides are shipped for use in the purifying of illuminating gas.

The Montmorency Paint Products Co., have operated a deposit at Beaupré, Pelletier township, Quebec for several years.

Prior to 1911 small quantities of ochre were produced intermittently from a deposit at Campbellville, Halton county, Ontario. No production has been recorded in this province since that date.

In 1921 a trial shipment of bog iron ore was made from Alta lake, British Columbia. The following year an experimental consignment was sent to Calgary by a small operator in the Windermere district, British Columbia. Shipments totalling 500 tons were made from these two deposits during 1923. There has been a small annual production during the past five years.

The Canadian production of iron oxides is marketed in two forms, namely, crude and calcined. Crude oxides are dried before shipment, and are mostly used in the purification of illuminating gas, while the calcined product is ground usually for consumption in the paint industry.

Table 255.—Production of Iron Oxides in Canada, 1920-1929

(For the Years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	19,128	157,909	1925.....	7,118	91,913
1921.....	9,048	93,610	1926.....	6,626	101,843
1922.....	7,285	110,608	1927.....	6,125	103,536
1923.....	10,424	129,636	1928.....	5,414	111,198
1924.....	7,266	91,160	1929.....	6,518	115,932

Table 256.—Production in Canada, Imports and Exports of Iron Oxides, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	6,125	103,536	5,414	111,198	6,518	115,932
IMPORTS—						
Ochres, ochrey earths, siennas, and umbers.....	2,654	90,614	3,279	111,751	3,495	121,698
Oxides, fire proofs, rough stuffs, fillers and colours, dry, n.o.p.....	3,356	632,470	3,485	709,529	3,683	790,654
EXPORTS—						
Mineral pigments, iron oxides and ochres..	852	34,800	1,124	44,342	1,113	42,554

Table 257.—Capital Employed in the Iron Oxides Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	134,854	133,736
Cost of supplies and stocks on hand.....	18,924	24,645
Cash, trading and operating accounts and bills receivable.....	473	1,142
Total.....	154,251	159,523

Table 258.—Employees, Salaries and Wages in the Iron Oxides Industry in Canada, 1928 and 1929

Class	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	3	4,074	2	3,560
Wage-earners.....	42	34,760	46	43,764
Grand total.....	45	38,834	48	47,324

Table 259.—Wage-Earners in the Iron Oxides Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	23	23	July.....	43	49
February.....	23	23	August.....	49	53
March.....	23	29	September.....	46	53
April.....	23	29	October.....	48	52
May.....	28	45	November.....	38	39
June.....	39	44	December.....	37	28

MICA

Important deposits of mica in Canada are located in the counties of Hull and Labelle in Quebec, and Lanark, Leeds and Frontenac in Ontario. The product of these mines, in the main part, is shipped first to mica-trimming shops, conveniently located, where it is either rough-cobbed or split and trimmed prior to exportation to the United States or Great Britain.

Mica from the island of Madagascar, the main source of phlogopite outside of Canada, is being imported into the United States, Canada's principal market, at a price below that at which the Canadian operator can afford to sell. Imports into Canada of mica and mica in manufactured form from both the United States and British India increased during the year.

Rough cobbed and thumb-trimmed mica exported amounted to 2 tons; splittings, 91 tons; and scrap and waste, 4,789 tons. The total value of Canadian mica exported during 1929 was \$213,059, which included shipments worth \$209,300 to the United States and \$2,228 to the United Kingdom.

It will be noted that the stated value of the exports of Canadian mica exceeded by a considerable amount the value placed on shipments reported by operators. An explanation of this, lies in the fact, that a large percentage of the value of exported material consisted of mica splittings shipped from large trimming shops situated in Ontario and Quebec.

Table 260.—Production of Mica in Canada, by Provinces, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	737	281,460	1,466	94,562	2,203	376,022
1921.....	484	41,172	218	28,891	702	70,063
1922.....	1,360	97,748	1,989	54,515	3,349	152,263
1923.....	1,545	216,684	1,980	110,290	3,525	326,974
1924.....	1,677	185,020	2,414	172,252	4,091	357,272
1925.....	2,415	178,800	1,605	82,663	4,020	261,463
1926.....	1,664	170,118	881	59,086	2,545	229,204
1927.....	1,454	99,194	1,284	75,183	2,738	174,377
1928.....	1,101	54,224	2,559	32,944	3,660	87,168
1929.....	1,062	72,630	2,991	45,919	4,053	118,549

Table 261.—Production of Mica in Canada by Grades, 1928 and 1929

	1928			1929		
	Pounds	Value f. o. b. shipping point	Price per pound	Pounds	Value f. o. b. shipping point	Price per pound
		\$	\$		\$	\$
Rough cobbled.....						
Thumb-trimmed.....	91,662	16,887	0-18	97,331	17,131	0-18
Splittings only.....	25,367	14,974	0-59	22,750	13,732	0-60
Scrap.....	7,202,795	55,307	0-003	7,986,878	87,686	0-01
Total.....	7,319,824	87,168	0-01	8,106,959	118,549	0-015

Table 262.—Production in Canada, Imports and Exports of Mica, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Quebec.....	1,454	99,194	1,101	54,224	1,062	72,630
O. tario.....	1,284	75,183	2,559	32,944	2,991	45,919
Total.....	2,738	174,377	3,660	87,168	4,053	118,549
IMPORTS—						
Mica and manufactures of, n.o.p.....		97,000		135,301		169,018
EXPORTS—						
Rough cobbled and thumb-trimmed.....	165	54,937	32	15,951	2	1,342
Splittings.....	159	213,651	84	80,902	91	96,726
Scrap and waste.....	4,536	57,499	4,346	78,262	4,789	112,905
Plate and manufactures (micanite).....		759		646		2,086
Total.....		326,846		175,761		213,059

Table 263.—Capital Employed in the Mica Mining Industry in Canada, by Provinces, 1928 and 1929

	1928			1929		
	Quebec	Ontario	Canada	Quebec	Ontario	Canada
	\$	\$	\$	\$	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools.....	97,351	27,842	125,193	157,887	29,037	186,924
Cost of supplies and stocks on hand.....	58,408	10,160	68,568	46,803	5,147	51,950
Cash, trading and operating accounts and bills receivable.....	49,017	17,296	66,313	39,921	2,500	42,421
Total.....	204,776	55,298	260,074	244,611	36,684	281,295

Table 264.—Wage-Earners in the Mica Mining Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	69	37	July.....	52	83
February.....	68	41	August.....	51	87
March.....	71	42	September.....	44	100
April.....	59	38	October.....	49	71
May.....	52	73	November.....	50	39
June.....	51	89	December.....	60	18

Table 265.—Employees, Salaries and Wages in the Mica Mining Industry in Canada, 1928 and 1929

	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
Salaried employees.....	6	6,480	5	11,116
Wage-earners.....	88	35,679	78	36,246
Total.....	94	42,159	83	47,362

Table 266.—World Production of Mica, 1925-1929

(From the Mineral Industry of the British Empire—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada (shipments).....	3,589	2,272	2,445	3,197	3,752
India (exports).....	4,985	4,497	3,874	4,774	5,804
Northern Rhodesia.....		4	8	4	3
Southern Rhodesia.....	130	163 (b)	183	183	169
Tanganyika Territory.....	68	52	42	33	29
Union of South Africa.....	1,054	1,130	1,660	3,572	1,525
Ceylon.....	1	(a)			1
Australia.....	4	11	5	12	27
Total.....	9,831	8,129	8,217	11,775	11,310
FOREIGN COUNTRIES					
United States (sales).....	9,457	7,258	6,282	7,680	6,491
Madagascar.....	282	325	497	625	420
Argentina (exports).....	117	83	75	118	(a)
Brazil.....	64	51	39	74	(a)
France (lithium mica).....		246	(a)	(a)	(a)
Japan.....	1,065	(a)	(a)	(a)	(a)
Germany (lithium mica).....	493	654	(a)	265	(a)
Guatemala.....	16	12	7	13	(a)
Chosen (Korea).....	20	16	(a)	45	41
Norway.....	23	41	8	84	58
Portugal (lithium mica).....		184	379	336	740
Russia (years ended Sept. 30).....	190	478	1,496	96	(a)
Sweden.....	93	52	10	12	(a)
Total.....	11,820	9,400	8,793	9,348	7,750
Grand total.....	21,651	17,529	17,010	21,194	18,927

(a) Data not available.

(b) In addition 19 tons of lithium mica were produced.

QUARTZ

Quartz production in Canada, prior to 1906, was not remunerative enough to cause much activity in this industry. The earliest record available show that in 1890 a shipment of 200 tons valued at \$1,000 was made from a Quebec deposit. Small shipments were recorded in 1893, 1896, 1898 and 1899. During 1906 production commenced for the purpose of supplying flux and furnace linings to the industries in the Sudbury district of Ontario. Shipments from the Ontario quarries have been continuous since that date.

Quartz for use as a flux was produced in Ontario and British Columbia. Silica sand for the manufacture of silica brick was obtained from deposits in Nova Scotia and Ontario. Considerable tonnages of silica sand were shipped from Quebec and Manitoba deposits for use in the manufacture of glass. Some shipments of quartz were made from Quebec quarries to chemical works during 1929.

Imports into Canada of silex or crystallized quartz totalled 3,995 tons evaluated at \$79,653; in 1928 the imports were recorded at 2,865 tons at \$73,755. Flint importations in 1929 reached a total of 3,595 tons appraised at \$39,272, as against 3,545 tons worth \$36,204 imported in the preceding year. Silex was obtained principally from the United States; flint was imported mainly from France and the United States.

Capital employed in the operation of the 20 quarries active during 1929 totalled \$1,000,232. Employment was furnished 279 salaried employees and wage-earners, whose combined earnings amounted to \$189,541. Fuel used during the year cost \$27,340.

Table 267.—Production of Quartz in Canada, 1920-1929

(For the years 1890 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	128,295	467,821	1925.....	197,224	363,612
1921.....	100,350	312,947	1926.....	232,082	553,161
1922.....	109,947	208,598	1927.....	233,984	496,364
1923.....	264,076	599,250	1928.....	282,522	523,933
1924.....	150,896	323,156	1929.....	265,949	561,527

Table 268.—Production in Canada, and Imports of Quartz, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Nova Scotia.....	4,834	16,721	7,424	28,022	11,845	31,388
Quebec.....	49,141	132,615	64,577	143,067	46,444	132,532
Ontario.....	159,150	266,204	194,503	308,608	187,973	316,050
Manitoba.....			*1	360	10,045	35,610
British Columbia.....	20,859	80,824	16,017	43,876	9,642	45,947
Total.....	233,984	496,364	282,522	523,933	265,949	561,527
IMPORTS—						
Silex or crystallized quartz, ground or un-ground.....	3,188	75,230	2,865	73,755	3,995	79,653
Flint.....	4,311	46,551	3,545	36,204	3,595	39,272

*Rose Quartz.

Table 269.—Capital Employed in the Quartz Mining Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	1,090,256	900,387
Cost of supplies and stocks on hand.....	51,246	79,581
Cash, trading and operating accounts and bills receivable.....	17,583	20,264
Total.....	1,159,085	1,000,232

Table 270.—Employees, Salaries and Wages in the Quartz Mining Industry in Canada, 1928 and 1929

	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	15	2	17	24,884	17	1	18	22,311
Wage-earners.....	241		241	197,788	261		261	167,140
Total.....	256	2	258	222,672	278	1	279	189,451

Table 271.—Wage-Earners in the Quartz Mining Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January.....	106	95	July.....	224	208
February.....	129	101	August.....	238	212
March.....	96	95	September.....	207	180
April.....	110	121	October.....	188	161
May.....	174	212	November.....	124	129
June.....	196	225	December.....	103	81

SALT

The production of salt in the province of Ontario was first recorded in 1866 when a company was formed to drill for oil on the north bank of the Maitland river, and, while no success attended the efforts of the drillers in their search for oil, a bed of rock salt was found at a depth of 964 feet. In September, 1866, this company (incorporated under the name of the *Godrrich Petroleum Company*, later changed to *Goderich Salt Company*) commenced pumping brine. In the initial working in connection with these deposits the refining was done by the kettle method, which was soon discarded and replaced by the pan method of evaporation. Wells were drilled and plants erected at Clinton and Searforth, Ontario, and four refineries were in operation at Goderich in 1879; at the present time there only two firms operating at Goderich.

Census reports show that there were 16 salt works in operation in Ontario and 2 in Nova Scotia during 1871. The Ontario plants employed 175 men with a total wage of \$60,990 while the products made were valued at \$119,999. In Nova Scotia during that year there were 10 employees who received \$2,040 and the total value of the plant production was \$16,600. According to the 1881 census, 26 plants were in operation in Ontario and 1 each in Nova Scotia and New Brunswick. Total employees that year numbered 247 earning \$78,517; products made were valued at \$395,848 and the capital invested in the operating plants was \$298,100. The development of the industry has reached the point where in 1929 the 8 plants in operation reported a capital investment of \$4,576,543 and the number of employees was 424 who received salaries and wages amounting to \$516,453.

Salt production in Canada established a new high mark in 1929, the output being 330,264 tons valued at \$1,578,086, an increase of 10·3 per cent in quantity and 5·5 per cent in value over the 1928 total of 299,445 tons at \$1,495,971. Shipments in 1929, exclusive of the salt content of brine used in the manufacture of chemicals, averaged \$8.70 per ton as compared with \$8.28 per ton in the previous year.

An increase of 8 per cent was recorded in Ontario's production; the total for 1929 was 302,445 tons or 91·6 per cent of the Canadian production. Output from the Malagash mine Nova Scotia continues to advance and the 1929 production was 42 per cent higher than the total in the previous year.

Canadian imports of salt decreased 6·6 per cent to 176,566 tons with a value of \$936,820. Salt exported from Canada amounted to 9,359 tons evaluated at \$70,762 as compared with 2,930 tons worth \$36,399 exported last year.

Table 272.—Production of Salt in Canada, 1920-1929

(For the years 1886 to 1929 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	209,855	1,544,724	1925.....	233,746	1,410,697
1921.....	164,658	1,673,685	1926.....	262,547	1,480,149
1922.....	181,794	1,628,323	1927.....	268,672	1,614,667
1923.....	202,397	1,713,516	1928.....	299,445	1,495,971
1924.....	207,979	1,374,780	1929.....	330,264	1,578,086

Table 273.—Production of Salt in Canada, by Grades, 1928 and 1929

Grade	1928			1929		
	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)	Manu- factured	Sold	Value of salt sold (Not includ- ing pack- ages)
	Tons	Tons	\$	Tons	Tons	\$
Table and dairy.....	56,252	56,214	708,927	54,618	54,138	785,559
Common fine.....	52,112	51,055	258,781	49,538	49,869	235,335
Common coarse.....	47,328	46,146	311,301	50,399	50,383	322,600
Land salt.....	3,662	3,685	17,798	1,407	1,919	7,209
Other grades.....	7,019	7,207	63,874	5,875	5,628	58,607
Brine for chemical works (Salt equivalent sold or used).....	135,138	135,138	135,290	168,327	168,327	168,776
Total.....	301,511	299,445	1,495,971	330,164	330,264	1,578,086
Value of packages.....			560,822			543,022
Grand total.....			2,056,793			2,121,108

Table 274.—Production in Canada, Imports, Exports and Consumption of Salt, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	268,672	1,614,667	299,445	1,495,971	330,264	1,578,086
IMPORTS—						
Salt, for the use of the sea or gulf fisheries.....	62,102	323,824	74,192	417,594	82,530	370,211
Salt, in bulk, n.o.p.....	72,933	321,533	68,765	254,218	54,997	208,130
Salt, n.o.p., in bags, barrels, etc.....	40,832	376,648	45,589	416,149	38,794	342,302
Salt, table, made by an admixture of other ingredients, when containing not less than 90 per cent of pure salt. (From April 1, 1926).....	844	55,070	479	35,007	245	16,177
Total.....	176,761	1,082,080	189,025	1,122,968	176,566	936,820
EXPORTS.....	1,212	22,793	2,930	36,399	9,359	70,762
APPARENT CONSUMPTION OF SALT.....	444,221	2,673,954	485,540	2,582,540	497,471	2,444,144

Table 275.—Capital Employed in the Salt Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	3,731,953	3,865,994
Cost of supplies and stocks on hand.....	235,405	334,338
Cash, trading and operating accounts and bills receivable.....	455,564	376,211
Total.....	4,422,922	4,576,543

Table 276.—Employees, Salaries and Wages in the Salt Industry in Canada, 1928 and 1929

	1928				1929			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
Salaried employees.....	45	16	61	\$ 117,376	41	12	53	\$ 102,502
Wage-earners.....	394		394	422,399	329	42	371	413,951
Total.....	439	16	455	539,775	370	54	424	516,453

Table 277.—Wage-Earners in the Salt Industry in Canada, by Months, 1928 and 1929

Month	1923		1929		Month	1928		1929	
	Male	Female	Male	Female		Male	Female	Male	Female
January.....	316	30	263	39	July.....	380	36	339	43
February.....	342	31	313	39	August.....	377	34	335	47
March.....	346	34	340	41	September.....	347	40	335	45
April.....	368	37	365	39	October.....	340	39	350	46
May.....	401	34	361	40	November.....	351	36	303	44
June.....	377	37	344	42	December.....	330	37	290	43

Table 278.—World Production of Salt, 1925-1929

(From the "Mineral Industry of the British Empire"—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....	1,933,590	1,727,443	1,983,486	1,946,318	1,974,170
Mauritius (estimated)†.....	1,500	1,500	1,500	1,500	1,500
Nigeria (estimated).....	400	400	400	400	400
Somaliland (exports).....	2,336	2,077	2,367	1,678	3,100
South-West Africa Territory.....	425	357	338	144	334
Anglo-Egyptian Sudan.....	9,000	9,194	9,716	12,284	14,715
Tanganyika Territory.....	4,000	3,105	4,775	5,053	7,270
Uganda.....		1,715	2,017	2,034	2,244
Union of South Africa (years ended June 30).....	58,333	79,245	79,146	82,412	(a)
Canada (shipments).....	208,702	234,417	239,886	269,206	294,789
West Indies (exports)†—					
Bahamas.....	1,291	7,400	1,900	700	800
Turks & Caicos Islands.....	62,432	53,958	27,923	50,043	61,153
Ceylon.....	20,263	15,962	25,668	43,576	(a)
Cyprus (estimated).....	3,000	3,000	3,000	3,000	3,000
India (including Aden).....	1,295,144	1,638,749	1,611,945	1,515,349	1,709,099
Weihaiwei (estimated).....	2,000	2,000	2,000	2,000	2,000
Palestine.....				1,628	2,468
Australia.....	126,251	139,101	123,212	130,785	84,457
Total.....	3,728,667	3,919,623	4,119,279	4,100,000	4,161,499
FOREIGN COUNTRIES					
Italian East Africa.....			67,000	100,000	(a)
Angola (estimated).....			10,000	10,000	10,000
Austria.....	128,705	142,849	145,741	151,389	175,663
Bulgaria.....	25,000		3,919	4,043	3,595
Czechoslovakia.....	75,591	96,556	120,272	151,678	(a)
France.....	(b) 1,327,049	(b) 1,617,405	1,315,300	1,571,699	(b) 1,486,435
Germany.....	2,188,347	2,406,772	2,758,524	2,863,384	2,994,461
Greece.....	3,507	89,309	102,730	57,661	(a)
Italy.....	900,922	754,150	1,030,475	889,121	(a)
Jugoslavia.....	53,638	51,435	53,900	51,305	(a)
Netherlands.....	34,191	34,894	37,439	40,815	44,205
Poland.....	423,197	450,646	530,694	560,337	560,000
Portugal.....		54	21	31	28
Rumania.....	325,139	338,628	322,847	337,365	316,422
Russia.....	1,404,862	1,823,344	2,387,651	2,286,563	(a)
Spain.....	846,556	1,079,939	963,754	967,533	(a)
Switzerland.....	73,954	76,047	77,026	78,719	85,110
Algeria.....	26,579	42,634	36,353	10,802	15,063

Table 278.—World Production of Salt, 1925-1929—Concluded

(From the "Mineral Industry of the British Empire"—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
FOREIGN COUNTRIES—Concluded					
Belgian Congo (estimated).....	80	80	80	80	80
Panama (estimated).....			50,000	50,000	50,000
Egypt (exports).....	207,795	177,394	219,020	165,222	146,669
Eritrea (estimated).....	20,000	20,000	20,000	20,000	(a)
French Morocco.....		1,200	3,500	(a)	(a)
French Somaliland.....		31,474	16,381	28,272	38,356
French West Africa (Mauritania).....		4,400	4,200	4,000	(a)
Tripoli (estimated).....	19,000	19,000	19,000	19,000	19,000
Tunis.....	126,378	130,778	142,501	(a)	(a)
Dutch West Indies (exports).....	18,087	9,999	8,088	(a)	(a)
Mexico (estimated).....	66,000	66,000	66,000	66,000	66,000
United States.....	6,604,909	6,581,786	6,757,759	7,209,553	7,628,179
Argentina (railway shipments).....	74,160	95,128	150,793	164,970	(a)
Chile.....	28,863	34,352	70,419	34,197	(a)
Colombia (estimated).....	29,000	29,000	29,000	29,000	29,000
Peru.....	23,002	29,638	29,695	32,222	(a)
Venezuela (estimated).....	30,000	30,000	30,000	30,000	30,000
China including Kwantung Peninsula (estimated).....	2,000,000	2,000,000	2,194,188	2,400,570	2,408,019
Dutch East Indies.....	434,364	375,173	247,484	238,298	(a)
Formosa.....	136,000	133,059	111,600	116,513	(a)
French Indo-China (exports).....	5,861	20,152	27,263	35,249	25,231
Japan.....	657,935	710,528	1,067,944	627,813	(a)
Portuguese India (estimated).....	12,000	12,000	12,000	12,000	12,000
Siam.....	124,094	123,685	113,534	117,447	(a)
Turkey (Anatolia) (estimated).....	100,000	100,000	100,000	100,000	100,000
Philippine Islands.....	30,120	23,695	65,616	(a)	(a)
Total.....	18,584,885	19,762,283	22,000,000	22,000,000	23,000,000
Grand total.....	22,313,552	23,681,906	26,000,000	26,000,000	27,000,000

(a) Data not available.

(b) Exclusive of sea salt.

(c) Sales.

†Sea salt.

TALC AND SOAPSTONE

Shipments of talc and soapstone ranging from 50 tons to 1,420 tons were made from Canadian deposits during the period 1886 to 1906. Prior to 1900 the production consisted mainly of impure talc and soapstone shipped from Quebec. It was not until 1900 that mining operations were commenced on the high grade talc deposits of the Madoc district. Ground talc was shipped from this district in 1906. Production advanced during the ensuing years until 1920 the high mark for the industry was reached, namely 21,671 tons valued at \$166,934, an average of \$7.70 per ton. In the following year the 4 companies operating employed 34 men and produced 10,124 tons with an average value of \$14.28 per ton. During 1929, the 5 firms operating in this industry employed 86 persons.

The Quebec production consisted of soapstone blocks and powder shipped from a quarry in Broughton township. Ontario operators near Madoc, Hastings county, shipped 15,463 tons of talc during the year. A small shipment was made from a talc deposit in the Lillooet mining division, B.C.

Table 279.—Production of Talc and Soapstone in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	21,671	166,934	1925.....	14,474	205,835
1921.....	10,124	144,565	1926.....	15,767	217,195
1922.....	13,195	188,458	1927.....	16,521	236,105
1923.....	10,366	150,507	1928.....	16,058	219,358
1924.....	11,332	154,480	1929.....	15,509	229,198

Table 280.—Production in Canada, Imports and Exports of Talc and Soapstone, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Soapstone.....	1,411	57,174		40,171		47,986
Talc.....	15,110	178,931	14,925	179,187	15,509	181,212
Total	16,521	236,105		219,358		229,198
IMPORTS—						
Talc or soapstone, ground or unground...	4,907	86,858	5,421	91,702	5,516	109,675
EXPORTS—						
Talc, crude.....	12	154				
Talc, refined.....	10,692	125,123	10,946	133,601	11,399	139,096

Table 281.—Capital Employed in the Talc and Soapstone Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	616,457	575,502
Cost of all supplies and stocks on hand.....	31,494	26,592
Cash, trading and operating accounts and bills receivable.....	84,657	52,541
Total	732,608	654,635

Table 282.—Employees, Salaries and Wages in the Talc and Soapstone Industry in Canada, 1928 and 1929

	1928				1929			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
				\$				\$
Salaried employees.....	7	2	9	17,410	7	2	9	13,705
Wage earners.....	82		82	67,751	77		77	60,595
Total	89	2	91	85,161	84	2	86	74,300

Table 283.—Wage-Earners in the Talc and Soapstone Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January.....	78	80	July.....	82	76
February.....	75	77	August.....	81	70
March.....	75	75	September.....	82	75
April.....	78	74	October.....	86	75
May.....	80	77	November.....	77	76
June.....	75	78	December.....	75	68

Table 284.—*World Production of Talc and Soapstone, 1925-1929

(From the "Mineral Industry of British Empire"—"Imperial Institute")

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom.....				161	29
Union of South Africa.....	85	41	344	518	435
Canada (shipments).....	12,923	14,078	14,751	13,326	13,847
India.....	8,525	9,674	5,053	5,539	7,217
Australia.....	1,052	911	1,069	1,327	569
Total.....	22,585	24,704	21,217	20,871	22,097
FOREIGN COUNTRIES					
Austria (exports).....	12,679	13,642	16,864	24,000	19,293
China.....	50	(a)	(a)		
Finland.....			1,033	4,650	(a)
France.....	68,256	74,544	74,400	(a)	(a)
Germany (Bavaria).....	3,405	3,772	6,280	7,748	(a)
Greece.....	92	149	210	30	(a)
Italy.....	33,089	42,355	32,400	32,469	34,000
Norway (exports).....	8,889	7,488	7,487	7,698	8,200
Rumania.....		480	860	2,130	1,060
Russia (years ended Sept. 30).....		2,948	2,085	2,717	(a)
Spain.....	898	3,800	2,777	3,278	(a)
Sweden.....	2,337	2,876	3,420	4,799	(a)
Morocco (French zone) (exports).....			2	527	600
United States.....	(b) 162,727	(b) 162,114	171,711	181,229	198,071
Uruguay (exports).....	899	883	1,085	1,727	928
Japan.....	43,385	(a)	59,000	(a)	(a)
Total.....	336,706	315,051	379,614	273,002	262,152
Grand total	359,291	339,755	400,831	293,873	284,249

(a) Data not available. (b) Talc only.

MISCELLANEOUS NON-METAL MINING INDUSTRIES

Included under this heading are the following non-metallic minerals:

Actinolite	Manganese, bog
Barytes	Mineral waters
Beryl	Natro-alunite
Bituminous sands	Phosphate
Fluorspar	Pyrites
Lithium minerals	Silica brick
Magnesite	Sodium carbonate
Magnesium sulphate	Sodium sulphate

Statistics relating to capital, labour, fuel and power are combined for these industries and are shown in Tables 285 to 287.

In addition to the foregoing, data are also shown for production, imports and exports of sulphuric acid.

Table 285.—Capital Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	3,954,644	3,516,650
Cost of supplies and stocks on hand.....	367,064	333,464
Cash, trading and operating accounts and bills receivable.....	156,773	192,524
Total	4,478,481	4,042,638

Table 286.—Employees, Salaries and Wages in the Miscellaneous Non-Metal Mining Industries, 1928 and 1929

	1928				1929			
	Number of employees			Salaries and wages	Number of employees			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				\$				\$
Salaried employees.....	36	5	41	73, 118	46	4	50	80, 716
Wage-earners.....	353		353	341, 532	456		456	464, 500
Total.....	389	5	394	414, 650	502	4	506	545, 216

Table 287.—Wage-Earners in the Miscellaneous Non-Metal Mining Industries, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	205	199	July.....	284	452
February.....	206	194	August.....	288	456
March.....	219	189	September.....	327	465
April.....	201	290	October.....	329	470
May.....	320	400	November.....	289	336
June.....	319	406	December.....	228	281

ACTINOLITE

Actinolite, which is a calcium-magnesium-iron silicate, is used in the manufacture of coal-tar roofing compounds. Mining of this mineral in Canada commenced in 1883. Canadian deposits from which production has been derived are located in Elzevir and Kaladar townships, Hastings county; Actinolite is the centre of this industry. In 1902 and 1903 production was at its peak and 550 tons were shipped; however, during the following six years, no operations were carried on. Shipments recommenced in 1910 and have continued up to the present. Annual production of ground actinolite during the past 9 years has ranged between 30 tons and 100 tons. In 1929, shipments to the United States from Canadian deposits amounted to 30 tons valued at \$375.

Table 288.—Production of Actinolite in Canada, 1920-1929

(For production from 1897 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
1920.....	100	\$ 1,160	1925.....	40	\$ 500
1921.....	78	975	1926.....	80	1,000
1922.....	50	575	1927.....	86	1,075
1923.....	53	583	1928.....	70	875
1924.....	90	1,225	1929.....	30	375

BARYTES

Deposits of barytes at Five Islands, Colchester county, and Brookfield, Hants county, Nova Scotia were first operated between 1865 and 1870. These deposits have produced about 5,000 tons of barytes. The McKellar Island deposit in Thunder Bay district, Ontario, in the course of its operations produced several thousand tons of ore. Work ceased on this property in 1894.

Large deposits of barytes at Lake Ainslie, Cape Breton Island, were opened up in 1894 and operations in this district have been practically continuous since that date. Between 1900 and 1903 the Cap Rouge deposit in North Cheticamp district was operated.

During 1918 a deposit in Langmuir township, Ontario, was operated and a mill for grinding and preparing barytes was completed shortly before the close of navigation. A shipment of 60 tons was made. Development work was done on the Bellew mine in North Burgess township in 1918. A deposit near Tionaga station was operated in 1923 and 200 tons of barytes were shipped.

There is a growing demand for barium products particularly in the pigment industries. Production of metallic barium began commercially in the United States during 1929; it is being used in a high-nickel alloy.

The 1929 Canadian barytes production was obtained from the Johnson mine at Lake Ainslie, Inverness county, Nova Scotia.

Table 289.—Production of Barytes in Canada, 1920-1929

(For the years 1885 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	751	22,983	1925.....	95	2,259
1921.....	270	9,567	1926.....	100	2,307
1922.....	289	9,537	1927.....	56	1,268
1923.....	409	8,548	1928.....	127	2,847
1924.....	151	3,308	1929.....	105	2,341

Table 290.—Production in Canada and Imports of Barytes, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	56	1,268	127	2,847	105	2,341
IMPORTS—						
Barium peroxide.....	35	3,195	7	1,304	14	2,216
Blanc fixe.....	511	28,053	622	35,470	946	52,473
Barytes.....	2,841	58,504	2,878	58,710	2,646	52,078
Lithopone.....	7,902	644,175	8,144	717,207	9,704	852,079
Satin white.....	1,044	29,528	1,413	46,703	1,252	38,315

BITUMINOUS SANDS

Bituminous sands are found in the Fort McMurray district, Alberta. This deposit is the largest occurrence of solid asphaltic material known. Considerable research work has been done in connection with these sands by the *Scientific and Industrial Research Council of Alberta* and the *Dominion Department of Mines*. Shipments of bituminous sands up to 1924 amounted to 531 tons. In 1925, the production was 1,148 tons at \$4,594; in 1926, shipments totalled 528 tons at \$2,112; and in 1927, the total was 2,706 tons valued at \$10,824. During these three years, the McMurray Asphaltum and Oil Company and the Federal Department of Mines were the only producers. During 1929, shipments amounting to 989 tons valued at \$3,956 were made.

Table 311.—Production of Bituminous Sands in Canada and Imports of Asphalt, 1927-1928

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Bituminous sands.....	2,706	10,824	94	374	989	3,956
IMPORTS—						
Asphalt, solid.....	47,737	856,225	47,991	822,425	53,760	829,328
Asphalt, not solid.....		38,566		46,890		99,704
Asphaltum oil for paving purposes.....		70,986		95,562		23,448
Total.....		965,777		964,877		952,480

FLUORSPAR

The first recorded shipment of fluorspar from a Canadian deposit was made in 1905, when 12 tons were shipped from a mine in Madoc township, Ontario. Five years later about 200 tons were mined in Huntingdon township of which quantity 2 tons were shipped. In 1911, the metallurgical works at Deloro and the steel foundries at Welland received small shipments. The next year a further small production was recorded, however in the following three years no shipments were made. During 1916, Ontario companies shipped 1,284 tons and increasing tonnages were produced during 1917 and 1918. In the latter year British Columbia became a factor in this industry as the Rock Candy mine near Grand Forks commenced operations.

The largest production from Canadian deposits took place in 1920 when 11,235 tons were shipped. Four mines were operated in that year employing 119 men whose wages totalled \$123,050.

Production of fluorspar in Canada during 1929 totalled 17,870 tons worth \$268,120. This year's production was obtained principally from the Consolidated Mining and Smelting Company's Rock Candy mine in British Columbia.

Table 292.—Production of Fluorspar in Canada, by Provinces, 1920-1929

(For the years 1905 to 1919 see Mineral Production of Canada 1923)

	Ontario		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....	3,758	68,475	7,477	171,971	11,235	240,446
1921.....	116	1,744	5,403	134,523	5,519	136,267
1922.....	284	3,905	4,219	98,233	4,503	102,138
1923.....	64	597	75	1,135	139	1,732
1924.....	76	1,343			76	1,343
1925.....	12	200	3,874	19,034	3,886	19,234
1926-1928.....						
1929.....	70	1,120	17,800	267,000	17,870	268,120

Table 293.—Production in Canada and Imports of Fluorspar, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....					17,870	268,120
IMPORTS—						
Hydrofluosilicic acid.....	5	811	6	1,646	36	4,706
Fluorspar.....	4,561	58,701	14,362	153,046	12,092	159,798

LITHIUM MINERALS

CANADA

In a statement prepared by J. F. Wright, *Federal Department of Mines*, Ottawa, Canada, on the subject of lithium minerals, there are the following remarks:—

An outcrop of massive lepidolite was discovered in July, 1924, about one mile south of the Winnipeg river, some 10 miles east and a little north of Pointe du Bois. The Manitoba lithium deposits are the only ones of possible commercial value known within the British Empire.

At the Silver Leaf Mining Syndicate deposit, the lithium minerals occur in pockets and lenses in the central portion of a body of pegmatite which is exposed for 125 feet in a general east-west direction and across an average width of 80 feet. An analysis of a hand-picked sample, judged to represent approximately the lithium-bearing rock after the gangue has been removed, gave 4.76 per cent lithia (Li_2O). There is estimated to be between 2,500 and 3,000 tons of this type of ore for each 10 feet in depth within a horizontal area equal to that at the surface. Two lens-shaped bodies of lepidolite, or a lithia mica of like character, estimated to contain about 540 tons of lithia ore for each 10 feet in depth and averaging 3.87 per cent lithia, occur near the south side of the pegmatite mass. This lithia mica contains only one-tenth of one per cent iron (Fe_2O_3), and therefore probably will be found satisfactory for the manufacture of opal, white and flint glass."

Active development commenced in 1925, camps being put up, and a compressor, drills, and gasoline engines installed. Three miles of pole tram-line and winter road were built to a point on the Winnipeg river a short distance below Lamprey Falls. A considerable tonnage of ore has been blasted out and some small shipments made to England, Germany and the United States. Transportation is not difficult as barges may be floated down the river to the railhead, Pointe du Bois.

MAGNESITE

Magnesite was discovered in Grenville township in 1900 but it was not until 1907 that work on a small scale was started on the deposits. The following year 120 tons were shipped for the manufacture of carbonic acid gas for the aerated waters industry and for use in making flooring cement.

The cutting off of the Austrian supply of magnesite to North America in 1914 brought attention to the Grenville deposits as a substitute in the manufacture of refractory brick and lining for metallurgical furnaces.

Operations in 1915 accounted for the employment of 110 men whose wages amounted to \$23,607 and the year's production was 14,779 tons. The next year 183 men were employed earning \$144,987 and producing 55,413 tons. From the point of tonnage produced 1917 was the record year for the magnesite industry in Canada as 58,090 tons were shipped with an average value of \$12.54 per ton; 296 men were on the payrolls with wages totalling \$194,864. Advances in prices took place in 1918 and consequently, although the production of 39,365 tons was 32.5 per cent less than the previous year, the value of \$1,016,765 was a record one for the industry. In 1918 employment was furnished 305 men who received \$326,417.

The hydromagnesite deposits near Atlin, British Columbia, were operated during 1915 and 1916; shipments recorded for the latter year amounted to 635 tons and were made to the eastern United States and to Great Britain. During 1921 a further shipment of 803 tons was made from these deposits. However, there has been no production since that date.

The Canadian production fell off sharply in 1921 to 3,730 tons but recovered somewhat in 1923 to 4,801 tons. In 1925 shipments totalled 5,576 tons valued at \$122,325; during 1927 a total of 7,337 tons were shipped with a valuation of \$230,309. An appreciable increase was recorded in the shipments of magnesite in 1928, when 13,195 tons worth \$346,990 were produced.

All the magnesite mined during 1928 was produced in the province of Quebec and was sold in two forms, namely, dead-burned and calcined. Dead-burned magnesite is used entirely in the metallurgical industry as a refractory lining for furnaces. Calcined magnesite is used as a plastic material for floors and walls in buildings and also in the manufacture of pipe and furnace coverings, as it has strong insulating properties. Considerable quantities of the metal magnesium are being utilized in the construction of motor car and aeroplane engines.

Shipments of dead-burned and calcined magnesite from Canadian deposits during 1929 reached a total of 18,809 tons valued at \$491,170, as compared with 13,195 tons at \$346,990 shipped in 1928. Exports of magnesite were recorded at 5,279 tons, a considerable increase over the 1928 total of 1,827 tons. These exportations were principally to the United Kingdom.

Table 294.—Production of Magnesite in Canada, 1920-1929

(For the years 1908 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	18,378	512,756	1925.....	5,576	122,325
1921.....	3,730	81,320	1926.....	4,571	137,431
1922.....	2,849	76,294	1927.....	7,337	230,309
1923.....	4,801	134,382	1928.....	13,195	346,990
1924.....	3,873	101,356	1929.....	18,809	491,170

Table 295.—Production in Canada, Imports and Exports of Magnesite, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Crude, mined.....	20,418		36,719		43,229	
Crude, calcined.....	18,593		31,488		39,514	
PRODUCTION—Calcined and dead-burned....	7,337	230,309	13,195	346,990	18,809	491,170
IMPORTS—						
Magnesia pipe covering.....		157,982		187,381		259,080
Magnesite.....	166	5,805	220	9,543	125	4,423
Magnesite firebrick.....		118,457		140,944		256,635
EXPORTS—						
Magnesite, calcined or dead-burned.....	1,953	47,487	1,837	44,101	5,279	125,613

Table 296.—World Production of Magnesite, 1925-1929

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

(Long tons)

Producing country and description	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Union of South Africa—					
Crude magnesite.....	1,795	1,854	1,810	1,457	1,682
Canada—					
Crude magnesite (mined).....	3,767	11,248	18,231	32,785	38,597
Caustic magnesite.....	4,979	4,081	6,551	11,781	16,697
Dead-burnt magnesite.....					
India—					
Crude magnesite.....	29,620	30,461	19,638	24,406	23,497
Australia—					
Crude magnesite.....	14,721	10,583	10,419	10,786	8,980
FOREIGN COUNTRIES					
Crude magnesite.....	336	233,000	350,000	305,000	430,000
Caustic magnesite (b).....	10,425	9,000	20,000	37,000	(a)
Dead-burnt magnesite (b).....	76,788	94,000	123,000	69,000	88,400
Bricks.....		(a)	45,000	41,000	45,000
Czechoslovakia—					
Crude magnesite (b).....	7,098	12,374	11,550	8,278	10,027
Calcined magnesite (b).....	29,207	33,070	34,132	37,018	42,616
Greece—					
Crude magnesite.....	89,394	94,128	83,150	102,772	(a)
Caustic magnesite.....	28,829	26,368	27,000	25,787	(a)
Dead-burnt magnesite.....		1,194	1,343	128	(a)
Italy—					
Crude magnesite.....	14,907	19,529	16,047	11,505	(a)
Jugoslavia (Serbia only)—					
Crude magnesite.....		(a)	1,653	6,168	5,777
Norway—					
Crude magnesite.....	1,672	704	1,073	917	1,012
Calcined magnesite (exports).....	445	198	262	314	503
Magnesia bricks (exports).....	405	304	269	387	362
Russia—					
Crude magnesite.....	74,642	101,390	104,900	118,000	130,614
Caustic magnesite.....	2,190	2,046	2,933	(a)	(a)
Dead-burnt magnesite.....	19,691	27,252	28,924	(a)	(a)
Magnesia bricks.....	10,535	11,865	13,900	(a)	(a)
United States—					
Crude magnesite.....	107,732	119,200	108,473	113,571	167,554
Caustic (sales).....		16,589	12,402	11,884	10,170
Dead-burnt (sales).....		37,982	35,902	40,384	70,268
Turkey—					
Crude magnesite.....					281

(a) Data not available.

(b) Exports less imports.

MAGNESIUM SULPHATE

In 1915 work commenced on the Spotted Lake deposit of magnesium sulphate, near Kruger mountain, Osoyoos division, British Columbia. Shipments were made of this material to the drug trade during 1915 and 1916. Crude magnesium sulphate to a total of 2,600 tons was extracted in 1917 of which quantity 929 tons were shipped to Oroville, Washington. The following year a deposit near Clinton, Lillooet district, was also operated. Preliminary shipments were made in 1920 from several lakes, containing these salts, on the Basque ranch, near Ashcroft, British Columbia.

No activities have been reported in this industry since 1923. In that year 121 tons of refined magnesium sulphate were shipped from a deposit near Ashcroft, British Columbia. Imports of magnesium sulphate or epsom salts during 1929 reached a total of 2,565 tons valued at \$53,481; in the previous year 2,508 tons worth \$47,717 were brought into Canada.

Table 297.—Production of Magnesium Sulphate in Canada, 1917-1929

Year	Tons	Value
		\$
1917.....	929	4,645
1918.....	1,949	14,565
1919.....	738	9,115
1920.....	1,947	39,886
1921.....	2,029	39,506
1922.....	1,021	24,017
1923.....	121	6,580
1924-1929.....		
Total.....	8,734	138,314

MANGANESE BOG

A deposit of bog manganese at Dawson Settlement, near Hillsborough, New Brunswick, was operated during 1929. The shipments from this property were consigned to the province of Quebec for use as a colouring agent in the brick trade.

MINERAL WATERS

A record of all the natural mineral waters produced in Canada and sold to the general public for medicinal purposes since 1888 has been compiled. In that year 124,850 gallons were produced and during the following ten years production varied between 424,600 gallons and 767,460 gallons. However, from 1899 to 1920 only the value of the shipments has been recorded; the high mark for the industry was reached in 1911 when the production was valued at \$223,758. Since 1920 shipments have fallen off to a marked degree; in 1922, production was 221,433 gallons worth \$14,220.

Production of mineral waters in Canada during 1929 amounted to 321,905 gallons valued at \$16,139, made up of 12,205 gallons from Quebec and 309,700 gallons from Ontario springs.

Table 298.—Production of Mineral Waters in Canada, 1920-1929

(For the years 1888 to 1919 see the Mineral Production of Canada, 1928)

Year	Imp. gal.	Value	Year	Imp. gal.	Value
		\$			\$
1920.....		24,582	1925.....	190,134	28,413
1921.....	328,273	21,716	1926.....	215,356	29,721
1922.....	221,433	14,220	1927.....	303,530	14,624
1923.....	232,451	16,455	1928.....	269,045	33,498
1924.....	209,353	15,421	1929.....	321,905	16,139

Table 299.—Production in Canada, Imports and Exports of Mineral Waters, 1927-1929

	1927		1928		1929	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		\$		\$		\$
PRODUCTION, by provinces—						
Quebec.....	10,330	1,813	15,415	5,608	12,205	2,488
Ontario.....	293,200	12,811	253,630	27,890	309,700	13,651
Total.....	303,530	14,624	269,045	33,498	321,905	16,139
IMPORTS—Mineral and aerated waters.....		216,793		209,714		253,940
EXPORTS—Mineral and aerated waters.....		16,780		31,621		12,320

NATRO-ALUNITE

Production of natro-alunite from a deposit at Kyuquot Sound, Vancouver Island, British Columbia, amounted to 30 tons in 1921. Small shipments were made during 1922, 1923 and 1925, but in 1926 there was no production. During 1927, a shipment of 7 tons of natro-alunite valued at \$248 was made, but since that year no shipments were reported. The preparation of natro-alunite for the market consists in crushing, grinding and roasting; the resultant product, calcined alunite, may be used as a fertilizer because of the potash content.

Table 300.—Production of Natro-Alunite in Canada, 1921-1929

Year	Tons	Value
		\$
1921.....	30	1,500
1922.....	50	2,500
1923.....	15	750
1924.....		
1925.....		
1926.....	20	1,000
1927.....	7	248
1928.....		
1929.....		
Total.....	122	5,998

PHOSPHATE

The existence of the extensive Lievre river deposits of crystalline phosphate lime or apatite was first noted in 1829. However, the first commercial shipments of this mineral in Canada were made between 1870 and 1877 from North Burgess township, Ontario to a superphosphate plant at Brockville. An active market was open in Europe for raw phosphate for fertilizer purposes and this added impetus to the mining of phosphate in Ontario and Quebec. From 1878 to 1892 inclusive, the industry in Canada was at its highest point, and 296,695 tons were produced. Exports during this 15-year period totalled 281,329 tons of which quantity Great Britain received approximately 86 per cent; the United States, 8 per cent; Germany, 5 per cent; and France, Denmark, Spain and Holland, the remainder. The maximum shipment of 31,753 tons was made in 1890. Since 1899, however, the annual production has exceeded the 1,500 ton mark only once.

The discovery and opening up in the United States of the large phosphate deposits in Florida in the nineties and later of those in Tennessee caused a sharp falling-off in prices for phosphate and resulted in the closing of the large Canadian mines.

The production of Canadian phosphate since 1895 has been mainly obtained as a by-product in the mining of mica.

Activity in the phosphate industry in Canada has been practically negligible for a number of years. In 1927 shipments of phosphate rock amounting to 151 tons valued at \$1,717 were made.

Construction was commenced in 1929 by the Consolidated Mining and Smelting Company on a large fertilizer plant at Trail, B.C. These works, when in operation, will consume considerable quantities of phosphate rock.

Shipments of phosphate from Canadian deposits amounted to \$1,185 tons valued at \$5,380; in 1928 the production was 641 tons worth \$3,276. The 1929 production was made up of 40 tons from Templeton township, Quebec, and 1,145 tons from a deposit near Fernie, B.C. Imports of phosphate into Canada during the year came entirely from the United States and totalled 18,192 tons valued at \$114,741.

Table 301.—Production of Phosphate in Canada, by Provinces, 1920-1929

(For the years 1870 to 1919 see Mineral Production of Canada 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
1920.....						
1921.....	30	450			30	450
1922.....	131	1,320	59	476	190	1,796
1923.....	30	600			30	600
1924.....						
1925.....	16	189			16	189
1926.....	40	800			40	800
1927.....	31	399	82	824 (a)	151	1,717
1928.....	91	1,126			(b) 641	8,276
1929.....	40	800			(c) 1,185	5,380

†No record of production.

(a) Includes 38 tons valued at \$494 shipped from British Columbia deposits.

(b) Includes 550 tons valued at \$7,150 shipped from British Columbia deposits.

(c) Includes 1,145 tons valued at \$4,580 shipped from British Columbia deposits.

Table 302.—Production in Canada, Imports and Exports of Phosphate, 1927-1929.

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION.....	151	1,717	641	8,276	1,185	5,380
IMPORTS—						
Phosphate rock.....	17,485	94,758	10,388	68,266	18,192	114,741
Acid phosphate (not medicinal).....	1,557	228,433	1,632	245,518	1,491	223,157
Phosphorus.....	44	34,618	21	14,795	39	29,777
Superphosphate or acid phosphate of lime.....	86,589	979,261	97,489	1,188,537	97,925	1,147,839
EXPORTS—Phosphate rock.....		33		44	52	1,408

PYRITES

Census returns for 1871 record a production of 2,800 tons of pyrites in Canada, made up of 2,300 tons from Quebec deposits and 500 tons from Ontario. However, it is only since 1886 that a continuous official record of pyrites production is available. Customs' records for the period 1881 to 1885 inclusive, show exports of 120,126 tons of pyrites to the United States. The 1886 output of pyrites was 42,906 tons, all of which was obtained from the Albert and Crown mines, Sherbrooke county, Quebec. In 1889, the production totalled 72,225 tons; shipments ranged from 27,687 tons to 158,566 tons during the following 24 years. The war years, 1914-1918, brought about an increased demand for sulphuric acid and a consequent advance in the production of pyrites. Shipments during this period reached a grand total of 1.6 million tons or approximately 46 per cent of the total Canadian production from 1886 to 1927.

It has been the practice of the Bureau in past years to report export shipments of pyrites in terms of the sulphur content of the pyrites. In view of the fact that there is now an important production of sulphur in the form of sulphuric acid made from waste bessemer gases, it has been decided to modify the method of reporting production so as to show the total sulphur content of pyrites shipped and of bessemer gases used in the manufacture of sulphuric acid.

The sulphur content of pyrites shipped and of waste bessemer gases used in the manufacture of sulphuric acid amounted to 42,781 tons valued at \$350,843 as compared with 38,589 tons worth \$321,033 produced in 1928. Pyrites shipments were made from Quebec, Ontario and British Columbia properties; sulphur was recovered from waste bessemer gases in Ontario and British Columbia. The total imports of sulphur and brimstone, crude or in roll or flour, during 1929 were recorded at 234,926 tons appraised at \$3,789,243 and were obtained principally from the United States.

Table 303.—Production of Pyrites in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Pyrites	Sulphur Content	Value	Year	Pyrites	Sulphur Content	Value
	tons	tons	\$		tons	tons	\$
1920.....	174,744	67,608	719,110	1925.....	15,605	7,587	58,899
1921.....	33,368	12,213	116,326	1926.....	17,845	8,975	63,899
1922.....	18,143	6,900	74,303	1927.....	50,863	25,229	198,388
1923.....	28,591	11,073	113,020	1928.....	68,836†	38,589	321,033
1924.....	23,552	9,742	95,620	1929.....	.....	42,781	350,843

† Since 1928 includes sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

Table 304.—Production in Canada, Imports and Exports of Pyrites, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$	Pyrites	Sulphur content	Pyrites	Sulphur content
PRODUCTION—				\$		\$
Quebec.....	13,021	42,795	4,389	1,552	20,186	9,926
Ontario.....	463	6,077	464	*4,974	677	4,579
British Columbia.....	37,379	149,516	63,983	32,063	56,395	28,276
Total.....	50,863	198,388	68,836	38,589	*321,033	77,258
IMPORTS—						
Brimstone or sulphur, crude or in roll or flour.....	177,686	2,918,047	182,343	2,962,935	234,926	3,789,243
EXPORTS—						
Sulphur contained in pyrites.....	13,611	105,981	31,596	249,705	31,987	246,771

* Since 1928 includes sulphur content of pyrites and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

SULPHURIC ACID

Statistics collected from 7 establishments manufacturing sulphuric acid in Canada during 1929 gave the production of the commodity in terms of the standard grades of 50° Bé, 60° Bé and 66° Bé. For comparative purposes it has been deemed advisable to reduce the first two grades to their equivalent in 66° Bé acid. The production of 66° Bé sulphuric acid in Canada during 1929 totalled 110,749 tons valued at \$1,375,599. Five of the producing companies used 10,461 tons of pyrites and 25,978 tons of brimstone, while two concerns used waste smelter gases.

Table 305.—Production, Imports and Exports of Sulphuric Acid, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
PRODUCTION—						
Sulphur used.....	19,805	386,557	18,903	381,806	25,978	542,194
Pyrites used.....	19,379	100,374	18,494	88,889	10,461	53,008
Acid made*.....	98,470	1,172,507	96,227	1,077,836	110,749	1,375,599
IMPORTS of acid.....	53	8,548	55	8,652	111	10,287
EXPORTS of acid.....	17,407	191,926	13,329	152,544	8,397	91,634

* Expressed in terms of 66° Bé acid. Includes also the production of the Canadian Industries, Ltd., at Coniston, Ont., who now produce sulphuric acid from waste smelter gases.

SILICA BRICK

Silica brick is produced in Canada at Sydney, Nova Scotia, and Sault Ste. Marie, Ontario. The Nova Scotia raw material is obtained from a quarry located at Leitches Creek in Cape Breton county. In Ontario the quartz is extracted from a quarry in Deroche township, and is used in the production of refractory brick for the lining of steel furnaces.

The total production during 1929 amounted to 3,951 thousand valued at \$173,581. The imports of silica brick during 1929 were valued at \$330,592.

SODIUM CARBONATE

The commercial deposits of natural sodium carbonate now being worked in Canada occur on the line of the Pacific Great Eastern Railway in the Clinton mining district of British Columbia, in the vicinity of 70 Mile House. Small annual shipments have been recorded from the British Columbia deposits since 1921; the maximum production, 1,120 tons valued at \$8,140, being shipped in 1925. During 1929 shipments amounted to 600 tons valued at \$8,100 as compared with 519 tons worth \$4,922 shipped in 1928.

Sodium carbonate is used largely in chemical and hydro-metallurgical plants. Its principal uses are, in the manufacture of glass, soap and paper; the bleaching and washing of linen, cotton, wool, etc., and the dyeing and printing of fabrics. Sodium carbonate has been utilized for some time as a means of removing, and of preventing the formation of boiler scale.

Soda ash from salt brine is made in Canada on a very large scale by Brunner-Mond Company Limited, at Amherstburg, Ontario.

Table 306.—Production of Sodium Carbonate in Canada, 1921-1929

Year	Tons	Value
		\$
1921.....	197	14,775
1922.....	262	3,627
1923.....	265	3,975
1924.....	510	5,173
1925.....	1,120	8,140
1926.....	595	5,370
1927.....	805	9,995
1928.....	519	4,922
1929.....	600	8,100
Total.....	4,813	63,477

SODIUM SULPHATE

Sodium sulphate is produced in Canada from natural deposits in Saskatchewan. The material produced may be hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate known to the trade as salt cake. It occurs as hydrous crystals or in the form of saturated brines in numerous lakes throughout Western Canada. Shipments from this source commenced in 1920 and 811 tons were produced during that year. There has been an annual production from these deposits since that date.

Sodium sulphate is used extensively in the pulp and paper, nickel, glass, dye and textile industries and to a smaller extent for medicinal and tanning purposes.

Three companies operated deposits of natural sodium sulphate in Saskatchewan during 1929. Shipments from these deposits were recorded at 5,018 tons valued at \$64,112 as compared with 6,016 tons at \$68,804 shipped in 1928.

Table 307.—Production of Sodium Sulphate in Canada, 1920-1929

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	811	19,496	1926.....	6,775	13,550
1921.....	623	13,850	1927.....	5,659	11,319
1922.....	504	11,986	1928.....	6,016	68,804
1923.....	733	10,189	1929.....	5,018	64,112
1924.....	1,083	6,004			
1925.....	3,876	19,380	Total.....	31,098	243,634

Table 308.—Production in Canada and Imports of Sodium Sulphate, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
PRODUCTION—		\$		\$		\$
Natural Sodium Sulphate—						
Crude.....	5,659	11,319	6,016	68,804	5,018	64,112
Artificial Sodium Sulphate—						
Sodium sulphate.....	375	6,624	2,160	41,042	2,452	44,494
Glauber's salt.....	2,226	45,239	2,199	45,484	1,589	34,962
IMPORTS—						
Soda, bisulphate of, or nitre cake.....	13,143	50,698	36,561	311,606	80,872	1,081,984
Soda, sulphate of, crude, known as salt cake.....	42,333	686,458	38,835	445,244	39,512	514,212
Glauber's salt.....	288	5,276	356	5,386	362	4,450

CHAPTER NINE

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

Including Cement, Clay and Clay Products (Brick, Drain Tile, Kaolin, Sewer Pipe, Structural Tile, Stoneware and Pottery made from Domestic Clays, Fireclay, Firebrick, Fireclay Blocks and Shapes, Imported-Clay Products), Lime, Sand and Gravel, Sand-Lime Brick, Slate, and Stone.

Production in the clay products and the other structural materials industries in Canada has increased over four-fold in the past twenty-two years; from a valuation of \$12,863,049 in 1907, the total for these industries rose to \$58,534,834 in 1929. This advance has been spread over all the industries included under this group. Cement production in Canada in 1887 amounted to 69,843 barrels worth \$81,909; in 1929 the total was 12,284,081 barrels valued at \$19,337,235. The value of clay products produced increased from \$1,126,057 in 1886 to \$13,904,643 in 1929. Lime shipments in 1886 were valued at \$283,755 or only 5 per cent of the 1929 value of \$5,908,610. The stone industry has also shown substantial growth; data for 1886 place the value of stone production at \$723,593, while the 1929 total was \$12,066,532. Sand and gravel production records date back no further than 1912; shipments during that year were valued at \$1,512,099 or only 20 per cent of the 1929 total of \$7,317,814.

Contracts awarded for building and construction in Canada in 1912 as reported by the *MacLean Building Review* were valued at \$463,083,000. In 1913 contract awards totalled \$384,157,000, and in the following year a decrease to \$241,952,000 was recorded. During the war period (1915-1918) construction work was largely neglected and the value of building awards remained below the 100-million-dollar mark during these years. A revival of building set in after the war, and in each year since 1920, the volume of building has been well above the 200-million-dollar mark. In 1929 the total value of building contracts awarded reached \$576,652,000, establishing a new high record in the building industry of Canada.

Table 309.—Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1927-1929

Province	1927	1928	1929
	\$	\$	\$
Nova Scotia.....	1,160,201	997,331	1,334,934
New Brunswick.....	475,365	400,140	585,696
Quebec.....	15,073,707	16,849,955	18,424,828
Ontario.....	19,662,038	20,438,279	25,001,461
Manitoba.....	2,373,075	3,166,797	4,291,397
Saskatchewan.....	574,304	809,371	1,190,168
Alberta.....	2,541,689	3,478,580	3,665,321
British Columbia.....	2,949,040	3,596,728	4,041,029
Canada.....	44,809,419	49,737,181	58,534,834

Table 310.—Production, Imports, Exports and Apparent Consumption of Clay Products and Other Structural Materials in Canada, 1927-1929

Item	Production	Imports	Exports	Apparent consumption
	\$	\$	\$	\$
Cement, portland.....	1927 14,391,937	105,420	303,144	14,189,213
	1928 16,739,163	177,758	340,624	16,576,297
	1929 19,337,235	254,111	252,955	19,338,391
Clay and clay products.....	1927 11,173,189	9,638,216	282,712	20,528,693
	1928 12,381,718	10,023,747	284,518	22,120,947
	1929 13,904,643	12,159,566	375,506	25,688,703
Lime.....	1927 3,923,388	70,075	367,939	3,625,524
	1928 4,534,568	64,811	357,085	4,242,294
	1929 5,908,610	49,395	428,209	5,529,796
Sand and gravel.....	1927 6,055,601	546,608	177,999	6,424,210
	1928 5,809,431	607,660	232,422	6,184,669
	1929 7,317,814	707,476	441,798	7,583,492
Slate.....	1927	205,066	.....	205,066
	1928	239,296	.....	239,296
	1929	296,638	.....	296,638
Stone.....	1927 9,265,304	1,110,100	141,306	10,234,098
	1928 10,272,301	1,550,447	250,215	11,572,533
	1929 12,066,532	2,068,453	237,121	13,897,864
Total.....	1927 44,809,419	11,676,485	1,278,109	55,207,804
	1928 49,737,181	12,663,719	1,464,864	60,936,036
	1929 58,534,834	15,535,639	1,735,589	72,334,884

CEMENT

Although the first official record of the production of cement in Canada is that of the manufacture of hydraulic cement from the black limestones of Quebec in 1856, it is understood that lime and hydraulic cement were made at Hull between 1830 and 1840. The cement was manufactured from a grey argillaceous magnesian limestone obtained nearby. Plants were also operated at an early date at the mouth of the Magdalen river, Gaspé county, and in Argenteuil county, Quebec; in Ontario, at Kingston and Thorold.

It was not until 1887 that serious competition to the domestic production showed itself in large importations of Portland cement. In order to cope with this competition two Canadian manufacturers of natural cement changed their mills and processes. Canadian Portland cement made its appearance on the market in 1889. Two additional plants were constructed about this time; one at Shallow Lake, Ontario, and another at Longue Pointe, Quebec.

The period 1898 to 1905 was the scene of a boom in the construction and promotion of cement plants in Canada. Eleven marl plants were erected during these years, of which only three were really successful.

In Nova Scotia puzzolan cement was first produced from blast furnace slag and lime at Sydney in 1905. This plant was closed down in 1915, re-opened in 1920, but has been idle since 1921.

Hydraulic cement was made at the Wright plant in Hull, Quebec, between 1830 and 1840. This cement sold at prices ranging between \$1.50 and \$2.50 per barrel of 300 pounds. Only natural cement was produced at this plant until the invasion of the Canadian market by imported Portland cement necessitated the changing of the processes in order to retain the local business. In 1889, the first Portland cement produced by this concern was placed on the market. Operations were carried on until the destruction of the plant by fire in 1900.

During 1888, a small plant was erected at Pointe Claire, near Montreal; a small quantity of Portland cement was produced but the operations were not successful and were discontinued. A plant was constructed in 1889 at Longue Pointe on the bank of the St. Lawrence river, east of Montreal and early the following year shipments of Portland cement commenced. The first dry process rotary kiln used in Canada was installed at this plant in 1899. Eight years later, the Vulcan Company purchased this property and built a new mill with the most modern equipment. Operations at this plant also ceased in 1914.

The construction of the International plant at Hull was started in 1903 and within two years shipments were being made. This plant was enlarged in 1908 and the following year it became a unit in the large merger company. Owing to lack of market, because of the war, the plant was closed in 1914. Considerable work was done on the mill in 1925 and in June, 1926, operations recommenced. Cement is now being made by the wet process at this plant.

A new plant was started in 1907 on the north side of the St. Lawrence river near the eastern limit of Montreal. Within two years the company was absorbed in the consolidation of thirteen plants in Canada. Very extensive alterations and additions were made to this plant, and it has been in continuous operation since 1909.

In August, 1925, the Unic plant was opened up at St. Francois de Sales, about 20 miles northeast of Montreal; operations ceased here in 1926.

The National plant at Montreal East commenced shipments in 1926.

In Ontario cement was produced at Napanee Mills (now Strathcona) in 1867. Clinker was made in kilns at this place and hauled by wagons to Napanee for grinding and packing. A new plant was constructed at Napanee Mills in 1891 for the production of Portland cement from marl and clay. Marl was transported 25 miles by rail from Marlbank and clay was obtained locally. Operations at this Strathcona mill commenced in December, 1891. During the same year a small Portland cement plant was erected at Marlbank which obtained its raw materials from Lime Lake. The following year, the Marlbank plant was opened up and operated until 1898 when it was remodelled. In 1900 the Strathcona and Marlbank plants were taken over by a new company, and three years later the Marlbank mill was enlarged and improved, with the result that, in 1904, the Strathcona mill was closed permanently. Marlbank operations continued only until 1914 and since then the plant has been dismantled.

A company was incorporated in April, 1888, for the purpose of making Portland cement at Shallow lake, Ontario. At that time the rotary kiln was a new departure in the cement industry in England and one of these kilns was purchased and put into operation at the newly erected plant. After many vicissitudes, the company was re-organized in 1902; new equipment was obtained, and operations were made commercially successful. The plant was active until 1914 but it has since been dismantled.

The Hanover plant in Ontario was built in 1898 to use marl and clay as raw materials. Marl was used at this plant until 1920 when it was replaced by limestone shipped by rail from Walkerton. In September, 1925, the mill was closed.

The Lakefield plant, in Ontario, another marl and clay proposition, was erected in 1901, and operated until 1914. This plant has been rebuilt and is again in operation.

Another mill was commenced in 1907 at Point Anne, near Belleville; shipments were started in the following year. Since that time the plant has been enlarged and operations have been carried on continuously.

Construction of a new plant at Port Colborne, near the lake Erie entrance to the Welland canal was started in 1907 and shipping commenced during 1908. In 1909, it became a unit of the merger company and was enlarged considerably; operations have been maintained since that date.

A departure from the dry process employed in the rock plants was instituted in 1912 when the St. Mary's mill was brought into operation using the wet process. This concern has been active during the past 14 years and is still a large producer.

Records for 1869 show two cement plants in Ontario, with an investment in plant and machinery of \$28,000, operating at Thorold and Napanee Mills and producing products valued at \$3,825. The following year these two plants employed 26 men and produced \$4,950 worth of products. In 1871 employment was furnished 28 men and the value of the mill output was \$11,700. The growth of the industry through the natural cement stage to the final concentration of the producers on the manufacture of Portland cement may be traced by the inception and subsequent disappearance of many companies. An idea of the magnitude of the industry can be obtained by a glance at the data for 1913 after consulting the figures for the earlier years, and then comparing these with the statistics for 1925 and 1927. In 1913 the 14 Ontario plants

with a production of 3,992,998 barrels, employed 1,382 men earning \$955,729, and in 1925 the 4 plants operating produced 3,462,358 barrels at \$5,253,911, employed 749 men whose wages totalled \$1,018,915. Incidentally the capital actually employed in 1925 was \$12,513,281. During 1927 four plants were operated, their locations being Belleville, Port Colborne, Lakefield and St. Mary's. The production amounted to 3,751,786 barrels with a valuation of \$5,144,326.

Cement production in Manitoba started with the manufacture of the natural product. The first plant was built at Arnold but the operations here ceased years ago. Babcock, a few miles from Arnold, was the site for another mill which was constructed in 1906. This plant is still active. The construction of a plant at Tuxedo (Fort Whyte) 9 miles southwest of Winnipeg was started in 1911. For two years this plant used clinker produced near Belleville, Ontario. Since 1913 this mill has been using limestone obtained from a quarry at Steep Rock on the east shore of Lake Manitoba, 145 miles north of Winnipeg. Cement is here made by the wet process.

Plants were erected at Calgary and Exshaw, Alberta, in 1906 and 1907. Raw materials for the former mill consisted of limestone hauled by rail from The Gap, some 60 miles west and shale from Sandstone, 20 miles south. The Exshaw mill, located 60 miles west of Calgary, uses limestone from a deposit close to the plant and shale which is transported by rail three miles from Kananaskis. In 1914 the Calgary mill was closed down and it has since been dismantled. A dry process plant was erected at Blairmore in 1909; it changed hands in 1919 but owing to insufficient demand for cement in the district, the plant has remained idle since that date.

A marl plant was built in 1912, at Marlboro about 140 miles west of Edmonton. Five years later a change was made to dry process, using limestone obtained from the mountains to the west, and local clay. Shipments have been made annually from this plant since 1917.

Work was commenced on a new plant at Medicine Hat in 1913 but the construction had not been completed before the outbreak of war in 1914 and the changed conditions caused the suspension of further work on this building.

The Canadian Pacific Railway Company was the first to attempt to manufacture cement in British Columbia. About the year 1891 this company started the replacement, on a large scale, of the original wooden structures on the mountain section of its line, using in this work large quantities of masonry. The cement required was very costly, as it was all brought from England in sailing vessels which had to make the long, slow trip around Cape Horn. In an effort to reduce this cost the company decided to investigate the possibility of making cement at or near Vancouver, and for this purpose brought out from the Isle of Wight an experienced cement maker and chemist, who, after examining various materials available, made a favourable report, and, in 1893, was commissioned to build a small plant on a site selected on the water front at Vancouver. Limestone was brought by barge from Texada island, about forty miles northwest of Vancouver, clay by rail from a cutting about thirty miles east, and coal by barge from the Dunsmuir mines on Vancouver island. The limestone was burned in simple kilns and then mixed with clay and water to form a slurry which was dried on a floor of iron plates with fires underneath. The dried slurry was burned in upright kilns and the clinker was ground by burr stones. The cement is said to have been of excellent quality and was used in thousands of yards of masonry which is still in good condition. This plant was in operation about ten years, after which it was dismantled.

In 1904, the Vancouver Portland Cement Company, Limited, built a rotary kiln plant at Tod Inlet on Vancouver island, and in 1912 the Associated Portland Cement Company (Canada), Limited, erected a similar plant at Bamberton, B.C. In 1916, these companies were united under the name of The British Columbia Cement Company, Limited.

In 1912, another plant was built near Princeton but the company operating it went into liquidation in 1914 and the plant has since been dismantled.

Canadian cement production set up a new high record in 1929. Shipments during 1929 totalled 12,284,081 barrels valued at \$19,337,235 as compared with 11,023,928 barrels worth \$16,739,163 produced in 1928.

Plants in Quebec, Ontario, Manitoba, Alberta and British Columbia were active during the year. Mills in Quebec produced 42.1 per cent of the total Canadian shipments; in Ontario, 37.7 per cent; in Manitoba, 8.1 per cent; in Alberta, 6.6 per cent, and in British Columbia, 5.5 per cent.

Imports of Portland cement into Canada during 1929 totalled 55,980 barrels averaging \$3.38 per barrel; in 1928 the average value was \$4.29 per barrel. Portland cement exports were recorded at 234,111 barrels valued at \$252,955. The supply of cement made available for consumption in Canada in 1929 was the greatest on record and amounted to 12,105,950 barrels.

FOLIO 456

Table 311.—Production of Cement in Canada, 1920-1929

(For the years 1887 to 1919 see Mineral Production of Canada, 1928)

Year	Barrels	Value	Year	Barrels	Value
		\$			\$
1920.....	6,651,980	14,798,070	1925.....	8,116,597	14,046,704
1921.....	5,752,885	14,195,143	1926.....	8,707,021	13,013,283
1922.....	6,943,972	15,438,481	1927.....	10,065,865	14,391,937
1923.....	7,543,589	15,064,661	1928.....	11,023,928	16,739,163
1924.....	7,498,624	13,398,411	1929.....	12,284,081	19,337,235

Table 312.—Output, Sales, Imports, Exports and Consumption of Cement in Canada, 1926-1928

	1927		1928		1929	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
OUTPUT.....	9,927,163	.....	11,076,659	.....	12,252,203	.....
SOLD OR USED.....	10,065,865	14,391,947	11,023,928	16,739,163	12,284,081	19,337,235
STOCKS DEC. 31.....	1,470,611	.....	1,520,583	.....	1,488,751	.....
IMPORTS—						
Portland cement.....	19,354	87,541	34,047	146,164	55,980	189,169
Manufactures.....		17,879		31,594		64,942
EXPORTS.....	249,694	308,144	267,325	340,624	234,111	252,955
APPARENT CONSUMPTION.....	9,835,525	.....	10,790,650	.....	12,105,950	.....

Table 313.—Production of Cement in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Barrels	Value	Barrels	Value	Barrels	Value
		\$		\$		\$
Quebec.....	4,636,751	5,383,058	4,013,820	6,305,396	5,169,408	7,120,374
Ontario.....	3,751,786	5,144,326	3,811,795	5,520,897	4,624,712	6,608,246
Manitoba.....	551,698	1,378,121	693,450	1,685,084	1,000,258	2,350,606
Alberta.....	601,699	1,363,880	834,067	1,732,582	808,796	1,770,786
British Columbia.....	523,931	1,182,552	670,796	1,495,204	680,907	1,487,223
Canada.....	10,065,865	14,391,937	11,023,928	16,739,163	12,284,081	19,337,235

Table 314.—Capital Employed in the Cement Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	35,365,970	39,007,891
Cost of supplies and stocks on hand.....	4,020,658	3,968,456
Cash, trading and operating accounts and bills receivable.....	8,292,213	7,905,471
Total.....	47,678,841	50,881,818

Table 315.—Employees, Salaries and Wages in the Cement Industry in Canada, 1928 and 1929

Class	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		\$		\$
SALARIED EMPLOYEES.....	122	256,867	124	260,579
WAGE-EARNERS.....	2,285	3,148,518	2,422	3,263,016
Total.....	2,407	3,405,385	2,546	3,523,595

Table 316.—Wage-Earners in the Cement Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January.....	1,867	2,190	July.....	2,433	2,619
February.....	1,941	2,087	August.....	2,423	2,613
March.....	2,030	2,220	September.....	2,383	2,447
April.....	2,156	2,239	October.....	2,311	2,435
May.....	2,412	2,432	November.....	2,356	2,428
June.....	2,468	2,555	December.....	2,263	2,250

CLAY AND CLAY PRODUCTS

Under "Clay and Clay Products" there have been included statistics relating to production in Canada from domestic clays, of (a) fireclay; (b) fireclay blocks and shapes; (c) firebrick; (d) brick made by the different processes, such as the soft mud process, stiff mud process and dry press; (e) structural tile, such as hollow blocks, roofing tile, floor tile (quarries), and ceramic or glazed floor and wall tile; (f) drain tile; (g) sewer pipe, including copings, flue linings, etc., and (h) pottery.

The clay products industry has been carried on in Canada for many years; census records for 1871 show 426 brick and tile producers in Canada, employing 3,073 workers whose wages totalled \$399,698. The value of products made in that year was \$925,235. Corresponding with the growth of the country, ten years later the number of plants in operation had risen to 560, with a payroll of 4,129 employees, wages amounting to \$608,690 and a production value of \$1,541,892. Statistics for 1886, record 261 brick and 82 tile plants in operation with a total output valued at \$1,016,217. Building brick (common and pressed) was produced in increasing quantities from the beginning of the century; 1900 recorded a valuation of \$2,275,000 while in 1906, the sum of \$4,102,590 was realized from the sale of these products. Almost similar conditions applied to the activities of the plants producing other clay products.

In 1920, the 223 operators reported sales aggregating in value \$10,664,929; wage-earners numbered 5,212, and the outlay for wages was \$5,053,837. In 1929 the 186 operators produced clay products valued at \$13,904,643, an increase of 13·6 per cent over the total for 1928. Ontario producers accounted for 49 per cent of the Canadian total and Quebec operators 23 per cent. In order of their relative clay products sales the other producing provinces were: Alberta, British Columbia, Nova Scotia, Saskatchewan, Manitoba and New Brunswick.

Canada's imports of clay and clay products during 1929 were valued at \$12,159,566 made up of importations from the United States valued at \$5,582,551; from the United Kingdom, \$4,360,754; from Germany, \$575,440; from France, \$496,960; from Japan, \$451,121; from Czechoslovakia, \$431,223; minor quantities were also received from 20 other countries. Pottery and chinaware imports accounted for 45·14 per cent of the total clay and clay products importations, refractory brick, 21·09 per cent; clays, 6·43 per cent; sanitary ware, 5·25 per cent; porcelain, insulators, 4·57 per cent; and building brick and blocks, 4·22 per cent.

Exports from Canada of clays, building bricks, porcelain insulators, earthenware and other clay manufactures were valued at \$375,506. The United Kingdom received 34 per cent of these exportations.

Imports of clay and clay products into Canada in 1928 were valued at \$10,023,747, including imports from Great Britain valued at \$3,910,376; from the United States, \$4,179,331; from Germany, \$594,846; from France, \$384,253; from Japan \$381,860; from Czechoslovakia, \$377,762; from Belgium, \$116,041; minor amounts were also received from 21 other countries. Exports of clay and clay products from Canada during 1928 were valued at \$284,518.

Brick.—Common and pressed brick produced in Canada during 1886 had a value of \$873,600; the plants in operation were located in Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, North West Territories and British Columbia. Progress in the brick industry was recorded during the succeeding twenty years and in 1906 the value of common and pressed brick produced reached a total of \$4,102,590. In the following year, data were obtained segregating the production of these two classes of brick: 439,016,000 common brick valued at \$3,455,524 and 78,922,000 pressed brick worth \$794,722 were shipped during 1907.

Common brick production reached its highest point in 1912 when 769,192,000 at an average value of \$9.11 per thousand, were shipped. During the same year pressed brick production established a record at 125,180,000 with an average value of \$12.86 per thousand. Since 1917, the value per thousand has never fallen as low as the average price in 1912.

Paving brick production in Canada was first recorded in 1897 when 4,568,000 were shipped by plants at Toronto, Ontario. During the period 1899-1907, the average annual production was 3,917,000. Prior to 1914 the total Canadian output of paving brick came from West Toronto, Ontario, where shale from the banks of the Humber river was used. In 1914, 1915 and 1916 the Clayburn plant in British Columbia produced a small quantity. In 1916 a plant at Edmonton, Alberta, produced a small quantity of paving brick. During the succeeding five years there was no production, but in 1922, the Clayburn plant shipped 151,000. Production ceased until 1926, when the British Columbia plant made shipments of 122,000 paving brick. In the following year a small shipment was made from this plant. The 1929 shipments consisted of 97,000 from the Clayburn plant.

Stoneware and Pottery from Domestic Clays.—Records for 1888 show shipments of pottery from Canadian plants valued at \$27,750; within the next four years the production had increased to nearly ten times that value. Production thereafter varied but remained above the \$100,000 mark each year up to the end of 1911. From 1912 to 1916, values ranged between \$35,371 and \$64,900. During the following years a considerable improvement was shown in annual sales and in 1929 a valuation of \$323,194 was recorded.

Four plants with total assets of \$696,154 were engaged primarily in the production of stoneware and pottery from Canadian clays in 1929. Employees in the industry totalled 155 persons whose earnings were \$177,620.

In New Brunswick, a plant at Saint John produces stoneware, Rockingham ware and flower pots from Canadian clay. Flower pots are produced from local clays at Toronto and Hamilton, Ontario. Rockingham ware and flower pots are produced at Medicine Hat, Alberta.

Fireclay.—Clays from the Drummond colliery at Westville, Nova Scotia, and from Flower Cove, New Brunswick, are used for the manufacture of refractory products.

In Quebec, the discoloured portions of the kaolin found at St. Remi d'Amherst can be utilized as a fireclay.

In the valleys of the Abitibi, Mattagami and Missinaibi rivers, which flow northward on the James bay slope, in Ontario, the occurrence of mesozoic deposits of refractory clays has been known for many years. The extension of the Temiskaming and Northern Ontario railway from Cochrane to Oil Can Portage on the Abitibi river has brought an important deposit within 12 miles of shipping facilities.

In Manitoba, semi-refractory shale is found in Turtle Mountain, at La Rivière and near Virden in the Assiniboine valley.

Refractory and semi-refractory clays occur in southern Saskatchewan. At Claybank, in the Dirt hills, south of Moose Jaw, standard firebrick, special shapes and face brick, are made from local clays. Similar clays are found near Michellton at Willows, south of Twelve Mile lake, and along the Frenchman river valley in the Cypress hills.

Along the Athabaska river near Fort McMurray, refractory and semi-refractory clays are found associated with the tar sands.

A very important deposit of fireclay occurs in Sumas mountain, about 40 miles eastward from Vancouver, British Columbia; at Clayburn refractory products are made from this clay. Refractory shales also occur near Whonnock and a residual fireclay deposit at Kyuquot, Vancouver Island, is operated; the clay is shipped to Victoria for the manufacture of stove linings and sewer pipe.

In 1889, the first production of fireclay in Canada was recorded, namely, 400 tons valued at \$4,800. The maximum production for the industry, in point of tonnage, was reached in 1917 when 10,534 tons were shipped. During 1929, total shipments from Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia amounted to 5,041 tons valued at \$35,226. Imports of fireclay into Canada in 1929 totalled 76,064 tons evaluated at \$322,508.

Firebrick.—Firebrick production in Canada from domestic clays reached its highest point in 1917 when 8,192,000 were produced with an average selling value of \$24.31 per thousand. Although sales have been smaller during the following years, higher prices prevailed and thus the 1917 aggregate valuation has been exceeded annually. During 1929 Nova Scotia, Saskatchewan, Alberta and British Columbia plants shipped 5,196,000 firebrick valued at \$251,043.

Fireclay Blocks and Shapes.—Plants in Nova Scotia, New Brunswick, Saskatchewan, and British Columbia produce special fireclay blocks and shapes from domestic clays. In 1907 the output of this class of refractory products was valued at \$18,000. Production increased until in 1918 a record for the industry was set up when shipments to a value of \$111,589 were made. The 1929 production established a new high record sales value of \$130,411.

Six plants in Canada, located at Montreal, St. Johns, Toronto and Hamilton produce special refractory blocks and shapes from imported clays.

Drain Tile.—Data regarding the production of drain tile in Canada are available since 1891. From information obtained by the *Ontario Department of Mines*, production during that year was valued at \$90,000. Ten years later production had increased until a valuation of \$250,000 was reached. During 1929 drain tile shipments totalled 25,000,000 valued at \$720,316, a new high record for the industry in Canada.

Kaolin.—Deposits of kaolin at St. Remi d'Amherst were first noted by the Geological Survey in 1894. Two years later samples were shipped to porcelain plants at Trenton, New Jersey, but it was not until 1911 that any serious attempt was made to develop this property. Production commenced in 1912, when 20 tons were shipped. Increases were recorded annually until the maximum production of 1,750 tons for the industry was reached in 1916. Shipments continued up to 1923, in which year, 163 tons were sold. No commercial shipments of kaolin have been made from Canadian deposits since 1923. During 1927 and 1928 small shipments were made from the St. Remi d'Amherst deposit for testing purposes.

Some development work was done during 1925 and 1926 on the china clay deposits on the Mattagami river, near Long Falls, Temiskaming district, Ontario.

Other Clays.—A shipment of 30 tons of bentonite valued at \$150 was made in 1926 from Princeton, British Columbia; in 1928, a further shipment of 20 tons was made. During 1926 development work was done near Williams lake, British Columbia, on a deposit of a refractory material known locally as kaolin but described merely as "silicate of alumina" by the Provincial Mineralogist; 129 tons value at \$1,900 were produced. This material was shipped to Vancouver, British Columbia, where some was used in the manufacture of plastic firebrick and refractory cements, and some directly as fireclay. Some small shipments of white ball clay have been made to the United States from Saskatchewan deposits.

Sewer Pipe.—Records of sewer pipe production in Canada date back to 1888 when shipments of this commodity were valued at \$266,320. Production being the succeeding years varied considerably until in 1907 a valuation of \$667,100 was recorded. Seven years later, 1914, the sewer pipe production was valued at \$1,104,499.

In 1929 a new high record for the industry was reached when sewer pipe, copings, and flue linings to a value of \$2,005,887 were shipped from plants in Nova Scotia, Quebec, Ontario, Alberta and British Columbia. The total capital employed in this industry was \$3,694,714 and employment was afforded 391 persons who received \$495,666 in salaries and wages.

Structural Tile.—Records of the production of structural tile in Canada include such items as hollow blocks (fireproofing and load-bearing tile), roofing tile, and floor tile. Hollow blocks are produced in every province except Prince Edward Island. Roofing and floor tile are made in Ontario. The total production of structural tile in Canada during 1929 was valued at \$2,289,198 as compared with a value of \$1,982,316 in the previous year.

In this section all tables except Table 319 show data for domestic clay products only.

Table 317.—Production of Clay Products in Canada from Domestic Clays by Provinces, 1920–1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
1920.....		541,114	73,484	2,376,029	5,613,488	206,764	471,448	786,430	596,172	10,664,929
1921.....		361,761	66,600	1,744,760	5,183,125	208,982	166,244	710,477	415,869	8,857,818
1922.....	3,975	427,643	75,425	2,494,236	6,944,218	210,740	134,704	700,063	447,452	11,438,456
1923.....		413,974	62,587	2,439,598	6,270,615	160,134	119,405	590,565	426,138	10,483,016
1924.....	3,340	355,948	74,994	2,435,696	5,089,299	117,450	137,280	540,477	460,594	9,215,077
1925.....	3,020	422,690	69,478	2,426,887	5,195,084	173,794	95,952	618,860	523,931	9,529,691
1926.....		362,667	75,851	2,702,298	5,356,469	248,497	214,113	804,933	592,495	10,357,323
1927.....		416,417	87,185	2,734,738	5,853,035	201,464	311,204	889,358	679,788	11,173,189
1928.....		496,577	72,192	3,097,295	6,177,664	291,791	377,896	1,162,264	706,039	12,381,718
1929.....		653,157	160,006	3,187,702	6,830,162	362,240	502,522	1,342,427	866,427	13,904,643

Table 318.—Production of Clay Products in Canada, from Domestic Clays, by Provinces, 1927–1929

Province	1927		1928		1929	
	Sold or used	Per cent of total value	Sold or used	Per cent of total value	Sold or used	Per cent of total value
	\$		\$		\$	
Nova Scotia.....	416,417	3.73	496,577	4.01	653,157	4.70
New Brunswick.....	87,185	0.78	72,192	0.58	160,006	1.15
Quebec.....	2,734,738	24.48	3,097,295	25.02	3,187,702	22.97
Ontario.....	5,853,035	52.38	6,177,664	49.89	6,830,162	49.12
Manitoba.....	201,464	1.80	291,791	2.36	362,240	2.61
Saskatchewan.....	311,204	2.79	377,896	3.05	502,522	3.61
Alberta.....	889,358	7.96	1,162,264	9.39	1,342,427	9.65
British Columbia.....	679,788	6.08	706,039	5.70	866,427	6.23
Canada.....	11,173,189	100.00	12,381,718	100.00	13,904,643	100.00

Table 319.—Value of Clay Products Produced in Canada from Domestic and from Imported Clays, 1928 and 1929

Product	From domestic clays		From imported clays		Total	
	1928	1929	1928	1929	1928	1929
	\$	\$	\$	\$	\$	\$
Fireclay blocks and shapes.....	105,091	130,411	313,637	362,360	418,728	492,771
Sanitary ware.....			520,871	*	520,871	
Ceramic or glazed floor and wall tile.....			133,411	*	133,411	
Pottery, glazed and unglazed.....	356,093	323,194	38,144	69,140	394,237	392,334
Electrical porcelain insulators.....			1,321,556	2,065,404	1,321,556	2,065,404
Other clay products (brick, tile, sewer pipe, etc.).....	11,920,534	13,451,038	131,182	876,134	12,051,716	14,327,172
Total.....	12,381,718	13,904,643	2,458,801	3,373,038	14,840,519	17,277,681

* Included with other clay products

Table 320.—Production in Canada, Imports and Exports of Clay and Clay Products, 1927-1929

Kind	1927		1928		1929	
	Quantity	Total selling value	Quantity	Total selling value	Quantity	Total selling value
		\$		\$		\$
PRODUCTION—						
Brick: Soft mud process (Face..... M	16,196	325,966	17,532	349,847	26,624	538,096
Common.. M	70,554	1,091,274	93,280	1,328,981	77,399	1,195,511
Stiff mud process (Face..... M	95,480	2,024,064	101,717	2,247,472	114,093	2,469,417
(wire cut) Common.. M	150,222	2,239,180	144,404	2,182,307	170,840	2,506,451
Dry press (Face..... M	39,753	833,570	36,587	748,301	38,591	813,461
Common..... M	14,617	187,062	24,294	337,096	26,131	368,039
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)..... M	620	29,372	599	28,763	187	12,795
Sewer brick..... M	10,997	210,643	2,888	59,010	4,765	96,588
Paving brick..... M	50	2,106	338	4,464	97	3,844
Firebrick from domestic clay M	5,388	246,266	4,940	234,460	5,196	251,043
Fireclay..... tons	5,070	35,961	5,123	35,284	5,041	35,226
Kaolin..... tons	24	120	5	25		
Pentonite..... tons			20	100		
Fireclay blocks and shapes.....		100,659		105,091		130,411
Structural tile:—						
Hollow blocks (including fireproofing and load-bearing tile)..... tons	151,307	1,431,141	205,257	1,930,152	221,800	2,214,384
Roofing tile..... No.	2,000	140	72,930	6,435	35,075	4,628
Floor tile (quarries)..... Sq. ft.	135,285	32,559	171,520	45,729	307,400	70,186
Drain tile..... M	22,259	598,098	22,029	656,054	25,000	720,316
Sewer pipe (including copings, flue linings, etc.)..... tons	77,262	1,475,875		1,723,644		2,005,887
Pottery, glazed or unglazed.....		307,057		356,093		323,194
Other products.....		2,076		2,410		142,166
Total.....		11,173,189		12,381,718		13,904,643
IMPORTS—						
Bath brick.....						
Building brick..... M	6,672	142,438	14,513	246,723	15,678	291,370
Building blocks.....		42,365		58,016		222,947
Clays—						
China..... cwt.	420,822	235,824	62,357	262,207	497,571	292,980
Fire..... cwt.	984,526	219,500	1,219,155	266,320	1,521,282	322,508
Pipe.....		2,258		794		570
Zirconium silicate.....		2,548		2,450		8,223
Zirconium oxide.....						8,244
Other clays.....		90,183		93,663		150,604
Drain tile, unglazed.....		2,059		556		2,809
Drain sewer pipe and earthenware fittings therefor, chimney linings or vents chimney tops or inverted blocks, glazed or unglazed.....		77,274		103,506		119,654
Insulators, electric, porcelain.....		437,328		510,008		556,535
Earthenware and chinaware.....		5,549,327		5,418,017		6,257,954
Brick, fire, other, valued at not less than \$100 per M, rectangular shaped: the dimensions of each not to exceed 125 cubic inches for use exclusively in the construction or repair of a furnace, kiln, etc.....		20,634		38,327		63,513
Brick, fire, n.o.p., for use exclusively in the construction or repair of a furnace, kiln or other equipment of a manufacturing establishment.....		1,152,277		1,217,003		1,706,109
Firebrick, n.o.p.....		121,343		117,539		76,963
Firebrick, chrome.....		52,565		56,375		101,302
Magnesite brick.....		118,457		140,944		256,635
Silica brick.....		329,214		259,192		330,592
Paving brick..... M	2,051	54,561	3,431	88,943	5,173	120,871
Other clay manufactures.....		988,061		1,143,164		1,239,183
Total.....		9,633,216		10,023,747		12,159,566
EXPORTS—						
Building brick..... M	1,450	23,059	3,034	46,037	1,587	21,797
Clay—						
Unmanufactured..... cwt.	15,454	2,940	19,903	20,577	16,379	6,640
Manufactures.....		86,746		76,526		54,397
Earthenware.....		14,771		17,235		24,563
Porcelain insulators.....		155,196		124,140		268,109
Total.....		282,712		284,518		375,506

Table 321.—Production of Building Brick in Canada by Provinces, 1927-1929

		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1927									
Soft mud process.	Face.....M	35		83	16,078				
	\$	735		1,243	323,988				
	Common.....M	972	2,885	6,187	44,882	1,132	863	2,305	11,348
	\$	12,893	44,100	63,353	740,664	18,100	10,592	28,461	173,111
Stiff mud process (wire cut).	Face.....M	1,845		24,762	65,894	143	1,419	1,545	372
	\$	31,068		577,348	1,321,604	3,800	42,711	35,613	11,920
	Common.....M	3,887		106,341	21,177	7,391	5,700	5,619	98
	\$	47,549		1,627,330	310,344	122,019	66,654	62,892	2,392
Dry press	Face.....M			2,134	32,690	947	576	2,448	949
	\$			63,047	641,903	21,921	19,197	48,467	39,035
Fancy or ornamental brick	Common.....M				1,147			13,470	
	\$				12,716			174,346	
Sewer brick	Common.....M			101	519				
	\$			4,356	25,016				
	\$				10,760				237
	\$				202,920				7,723
Total.....M		6,239	2,885	139,588	193,156	9,612	8,567	25,387	13,004
	\$	92,245	44,100	2,336,677	3,579,155	165,840	139,154	349,779	234,181
1928									
Soft mud process.	Face.....M	185	50	70	16,327			662	238
	\$	2,220	1,000	1,115	317,800			22,163	5,549
	Common.....M	1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
	\$	13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Stiff mud process (wire cut).	Face.....M	1,510		29,914	64,664	2,014	1,374	1,845	1,396
	\$	34,639		686,752	1,367,859	42,350	44,208	17,927	53,737
	Common.....M	6,137		99,014	23,711		9,981	3,479	2,082
	\$	77,193		1,542,576	383,687		114,106	33,352	31,393
Dry press	Face.....M			2,492	29,182		432	4,481	
	\$			66,842	581,609		12,426	87,424	
Fancy or ornamental brick	Common.....M			52	3,460	328		17,593	2,861
	\$			511	43,753	4,945		243,039	44,848
Sewer brick	Common.....M			67	532				
	\$			3,049	25,714				
	\$				2,621				
	\$				49,547				
Total.....M		8,848	2,001	150,185	186,290	15,595	11,887	35,181	11,047
	\$	127,314	31,678	2,470,152	3,497,292	256,870	172,440	510,515	206,053
1929									
Soft mud process.	Face.....M	185	60	1,000	25,379				
	\$	2,405	1,500	12,000	522,191				
	Common.....M	757	3,471	7,468	38,055	14,409	473	3,390	9,376
	\$	10,020	55,120	76,963	606,714	234,481	7,031	45,932	159,250
Stiff mud process (wire cut).	Face.....M	1,651	432	38,146	63,569	3,040	2,071	2,281	2,903
	\$	44,654	10,808	771,573	1,333,723	70,940	62,790	67,166	107,763
	Common.....M	12,818	2,124	99,818	31,525		10,573	13,896	86
	\$	160,906	31,860	1,529,751	505,958		121,833	157,250	1,893
Dry press	Face.....M			2,990	30,292		1,184	4,125	
	\$			81,333	611,625		38,652	81,851	
Fancy or ornamental brick	Common.....M				5,482			18,322	2,327
	\$				75,016			254,472	37,551
Sewer brick	Common.....M			75	112				
	\$			3,783	9,012				
	\$				4,631				154
	\$				92,316				4,272
Total.....M		15,411	6,087	149,497	199,045	17,449	14,301	42,014	14,826
	\$	217,985	99,288	2,475,403	3,757,555	305,421	230,306	606,671	310,729

Table 322.—Production of Building Brick (Common and Pressed) in Canada, 1886-1923

Year	Common and Pressed*		Year	Common		Pressed		Total	
	Quantity	Value		Quantity	Value	Quantity	Value	Quantity	Value
	M	\$		M	\$	M	\$	M	\$
1886.....		873,600	1907.....	439,016	3,455,524	78,922	794,722	517,938	4,250,246
1887.....		986,689	1908.....	353,261	2,611,554	53,481	517,180	406,742	3,128,734
1888.....		1,036,746	1909.....	539,229	4,212,424	57,265	630,677	596,494	4,843,101
1889.....		1,273,884	1910.....	627,715	5,105,354	67,895	807,294	695,610	5,912,648
1890.....		1,266,982	1911.....	645,551	5,420,890	87,351	1,094,582	732,902	6,515,472
1891.....		1,061,536	1912.....	769,192	7,010,375	125,180	1,609,854	894,372	8,620,229
1892.....		1,251,934	1913.....	668,427	5,917,373	116,802	1,458,753	785,229	7,376,106
1893.....		1,800,000	1914.....	457,514	3,653,861	93,635	1,115,556	551,149	4,769,417
1894.....		1,800,000	1915.....	234,733	1,755,187	49,817	492,774	284,550	2,247,961
1895.....		1,670,000	1916.....	237,035	1,826,844	44,947	492,355	281,982	2,319,199
1896.....		1,600,000	1917.....	210,631	1,999,465	46,409	653,153	257,040	2,652,618
1897.....		1,600,000	1918.....	164,970	1,879,811	40,147	639,083	205,117	2,518,894
1898.....		1,900,000	1919.....	291,470	3,850,219	74,424	1,304,162	365,894	5,154,381
1899.....		2,195,000	1920.....	303,343	4,835,996	85,137	2,004,537	388,480	6,840,533
1900.....		2,275,000	1921.....	220,438	3,567,503	80,947	1,738,293	301,385	5,305,796
1901.....		2,400,000	1922.....	294,919	4,714,658	90,578	1,839,599	385,497	6,554,207
1902.....		2,593,000	1923.....	250,565	3,884,474	73,400	1,461,483	223,965	5,345,957
1903.....		2,832,000							
1904.....		2,983,000	Total.....						125,791,385
1905.....	523,820	3,933,925							
1906.....	523,390	4,102,590							

* Separate statistics not available till 1907.

Table 323.—Production of Building Brick in Canada, 1924-1929

	Soft mud process		Stiff mud process (wire cut)		Dry Press		Fancy or ornamental brick	Sewer brick	Total
	Face	Common	Face	Common	Face	Common			
	M	\$	M	\$	M	\$			
1924.....	10,831	50,079	80,565	124,556	35,203	12,794	755	2,690	317,473
1925.....	185,248	746,044	1,842,224	1,880,631	761,572	168,043	98,400	40,775	5,722,997
1926.....	27,701	51,214	93,903	116,105	37,201	22,053	524	2,485	351,186
1927.....	521,739	753,970	1,883,856	1,635,257	800,504	270,135	26,320	52,382	5,944,163
1928.....	28,235	78,158	101,028	94,046	30,423	19,450	462	6,546	358,348
1929.....	556,573	1,145,490	2,146,362	1,624,055	651,236	260,598	24,057	117,194	6,525,565
1930.....	16,196	70,554	95,480	150,222	39,753	14,617	620	10,997	398,439
1931.....	325,966	1,091,274	2,024,064	2,239,180	833,570	187,062	29,372	210,643	6,941,131
1932.....	17,532	93,280	101,717	144,404	36,587	24,294	599	2,888	421,301
1933.....	349,847	1,328,981	2,247,472	2,182,307	748,301	337,096	28,763	59,010	7,281,777
1934.....	26,624	77,399	114,093	170,840	38,591	26,131	187	4,765	458,630
1935.....	538,096	1,195,511	2,469,417	2,509,451	813,461	368,039	12,795	96,588	8,003,358
Total.....	127,119	420,684	586,786	800,173	217,758	119,339	3,147	30,371	2,305,377
	2,477,469	6,261,270	12,613,395	12,070,881	4,608,644	1,590,973	219,767	576,592	40,418,991

Table 324.—Production of Paving Brick* in Canada, 1897-1929

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	M	\$		M	\$		M	\$
1897.....	4,568	45,670	1906.....	3,000	45,000	1915.....	1,228	20,694
1898.....			1907.....	3,618	72,354	1916.....	1,590	30,144
1899.....	5,300	42,550	1908.....	3,720	59,456	1917-1921.....		
1900.....	2,710	26,950	1909.....	3,760	67,408	1922.....	151	5,972
1901.....	3,689	37,000	1910.....	4,215	78,080	1923-1925.....		
1902.....	4,211	42,000	1911.....	5,220	79,444	1926.....	122	5,015
1903.....	3,789	45,288	1912.....	4,580	85,989	1927.....	50	2,107
1904.....	4,436	55,450	1913.....	4,208	75,669	1928.....	338	4,464
1905.....	4,500	54,000	1914.....	2,707	49,627	1929.....	97	3,844
						Total.....	71,807	1,035,074

*Figures prior to 1907 compiled by the Ontario Bureau of Mines.

Table 325.—Production of Structural Tile in Canada, by Provinces, 1927-1929

Province	Hollow blocks (including fireproofing and load-bearing tile)		Roofing tile		Floor tile (quarries)	
	Tons	Value	No.	Value	Sq. ft.	Value
1927		\$		\$		\$
Nova Scotia.....	8,793	96,260				
Quebec.....	25,034	257,558				
Ontario.....	86,690	775,806	2,000	140	134,910	32,490
Manitoba.....	1,552	18,862				
Saskatchewan.....	6,500	65,000				
Alberta.....	15,345	142,156				
British Columbia.....	7,393	75,499			375	69
Canada.....	151,307	1,431,141	2,000	140	135,285	32,559
1928						
Nova Scotia.....	11,254	132,594				
Quebec.....	40,607	441,107			500	50
Ontario.....	112,887	983,005	72,930	6,435	171,020	45,679
Manitoba.....	2,100	25,710				
Saskatchewan.....	10,120	81,202				
Alberta.....	18,432	166,142				
British Columbia.....	9,857	100,392				
Canada.....	205,257	1,930,152	72,930	6,435	171,520	45,729
1929						
Nova Scotia.....	15,455	182,076				
New Brunswick.....	1,119	23,734				
Quebec.....	49,488	536,684				
Ontario.....	103,454	972,993	35,075	4,628	307,400	70,186
Manitoba.....	2,785	41,254				
Saskatchewan.....	13,257	111,072				
Alberta.....	20,812	195,503				
British Columbia.....	15,430	151,068				
Canada.....	221,800	2,214,384	35,075	4,628	307,400	70,186

Table 326.—Production of Sewer Pipe in Canada, 1920-1929

(For the years 1888 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	58,887	1,549,090	1925.....	73,791	1,440,269
1921.....		1,666,584	1926.....	75,996	1,480,776
1922.....	75,932	1,766,347	1927.....	77,262	1,475,875
1923.....	70,252	1,616,324	1928.....		1,723,644
1924.....	76,355	1,594,280	1929.....		2,005,887

*Data not available.

Table 327.—Production of Drain Tile in Canada, 1920-1929

(For the years 1891 to 1919 see Mineral Production of Canada, 1928)

Year	Quantity	Value	Year	Quantity	Value
	M	\$		M	\$
1920.....	14,527	562,652	1925.....	14,552	401,503
1921.....		473,952	1926.....	14,258	396,018
1922.....	14,728	407,386	1927.....	22,259	598,098
1923.....	10,599	323,314	1928.....	22,629	656,054
1924.....	15,137	409,369	1929.....	25,000	720,316

Table 328.—Production of Drain Tile and Sewer Pipe, in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Drain tile		Sewer pipe		Drain tile		Sewer pipe	
	M	\$	Tons	\$	M	\$	Tons	\$
Nova Scotia.....	89	3,282	.....	211,833	131	5,284	.....	225,128
Quebec.....	531	18,833	.....	163,521	807	28,500	.....	147,115
Ontario.....	20,276	572,577	.....	974,157	22,535	629,322	.....	1,167,463
Manitoba.....	149	9,211	.....	.....	392	15,565	.....	.....
Saskatchewan.....	15	600	.....	.....	25	1,000	.....	.....
Alberta.....	377	12,761	.....	247,410	158	7,711	.....	335,954
British Columbia.....	1,192	38,790	.....	126,723	952	32,934	.....	130,227
Canada.....	22,629	656,054	.....	1,723,644	25,000	720,316	.....	2,005,887

Table 329.—Production of Pottery from Domestic Clays in Canada, 1920-1929

(For the years 1888 to 1919 see Mineral Production of Canada, 1928)

Year	Value	Year	Value
	\$		\$
1920.....	209,171	1925.....	267,255
1921.....	231,263	1926.....	320,135
1922.....	266,391	1927.....	307,057
1923.....	229,547	1928.....	356,093
1924.....	238,342	1929.....	323,194

Table 330.—Production of Kaolin in Canada, 1912-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		\$			\$			\$
1912.....	20	160	1918.....	863	19,299	1924-1926.....	.....	.....
1913.....	500	5,000	1919.....	759	13,744	1927.....	24	120
1914.....	1,000	10,000	1920.....	683	15,022	1928.....	5	25
1915.....	1,300	13,000	1921.....	124	1,888	1929.....	.....	.....
1916.....	1,750	17,500	1922.....	1,197	17,866			
1917.....	533	9,594	1923.....	163	2,369	Total.....	8,921	125,587

Table 331.—Production of Fireclay in Canada, 1920-1929

(For years 1899 to 1919 see Mineral Production of Canada, 1928)

Year	Quantity	Value	Year	Quantity	Value
	Tons	\$		Tons	\$
1920.....	8,321	44,091	1925.....	623	6,544
1921.....	2,931	29,851	1926.....	2,513	23,258
1922.....	10,196	55,185	1927.....	5,070	35,961
1923.....	2,685	24,153	1928.....	5,123	35,284
1924.....	3,645	26,258	1929.....	5,041	35,226

Table 332.—Production of Firebrick and Fireclay Blocks and Shapes in Canada, from Domestic Clays, 1920-1929

(For the years 1907 to 1919 see Mineral Production of Canada, 1928)

Year	Firebrick		Fireclay, blocks and shapes	Year	Firebrick		Fireclay blocks and shapes
	Quantity	Value	Value		Quantity	Value	Value
	M	\$	\$		M	\$	\$
1920.....	7,293	375,230	54,792	1925.....	6,197	305,332	36,567
1921.....	4,502	242,462	91,685	1926.....	4,195	192,276	54,064
1922.....	6,705	251,776	65,588	1927.....	5,388	246,266	100,659
1923.....	6,122	295,037	81,345	1928.....	4,910	234,460	105,091
1924.....	4,327	209,256	51,273	1929.....	5,196	251,043	130,411

Table 333.—Production of Refractories, in Canada, from Domestic Clays, by Provinces, 1928 and 1929

Province	1928					1929				
	Fireclay		Firebrick		Fire-clay blocks and shapes	Fireclay		Firebrick		Fire-clay blocks and shapes
	Quantity	Value	Quantity	Value	Value	Quantity	Value	Quantity	Value	Value
	Tons	\$	M	\$	\$	Tons	\$	M	\$	\$
Nova Scotia.....	2,615	9,705	138	10,799	1,050	2,972	10,669	154	11,340	675
New Brunswick.....	67	1,848	.....	.....	1,621	47	1,863	.....	.....	1,351
Saskatchewan.....	1,327	9,183	713	40,582	73,301	754	5,965	808	43,384	106,643
Alberta.....	.....	.....	84	4,507	.....	48	624	59	2,934	.....
British Columbia.....	1,114	14,548	4,005	178,672	29,119	1,220	16,105	4,175	193,385	21,742
Canada.....	5,123	35,234	4,940	234,460	105,091	5,041	35,226	5,196	251,043	130,411

Table 334.—Plants Reporting Shipments in the Clay Products Industry in Canada, by Provinces, 1929

Province	Number of plants in groups indicated					
	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	Total
Nova Scotia.....	6	1	1	.....	1	9
New Brunswick.....	2	.....	.....	1	.....	3
Quebec.....	18	1	1	.....	.....	20
Ontario.....	128	3	1	2	.....	134
Manitoba.....	6	.....	.....	.....	.....	6
Saskatchewan.....	4	.....	.....	.....	.....	4
Alberta.....	8	.....	1	1	.....	10
British Columbia.....	9	.....	1	.....	.....	10
Canada.....	181	5	5	4	1	196

Table 335.—Capital Employed in the Clay Products Industry in Canada, by Provinces, 1928 and 1929

Industry and Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
By Industries—								
<i>Brick and Tile—</i>								
<i>* Nova Scotia.....</i>	376,538	60,408	83,298	520,244	475,368	79,037	95,707	650,112
Quebec.....	9,043,693	802,217	485,021	10,330,931	9,911,417	920,863	610,720	11,443,000
Ontario.....	9,000,199	1,050,323	1,073,082	11,123,604	8,514,966	1,215,806	1,265,272	10,996,044
Manitoba.....	166,670	58,610	120,958	346,238	274,108	74,989	105,050	454,147
Saskatchewan.....	873,246	76,443	80,426	1,030,115	895,884	72,424	134,132	1,102,440
Alberta.....	1,210,456	146,865	148,113	1,505,434	1,177,984	145,583	175,412	1,498,979
British Columbia.....	905,604	187,698	133,873	1,227,175	1,022,296	175,406	161,264	1,358,966
Total for Canada.....	21,576,406	2,382,564	2,124,771	26,083,741	22,272,023	2,684,108	2,547,557	27,503,688
<i>Clay sewer pipe—</i>								
Total for Canada.....	2,745,349	601,476	399,666	3,746,491	2,825,250	599,821	269,645	3,694,716
<i>Firebrick and fireclay products—</i>								
Total for Canada.....	1,355,843	239,986	645,887	2,241,716	1,418,530	182,460	694,508	2,295,498
<i>Kaolin and other clays—</i>								
Total for Canada.....								
<i>Stoneware and pottery—</i>								
Total for Canada.....	261,836	68,008	71,411	401,255	540,755	93,883	61,516	696,154
By Provinces—								
<i>Total for clay and clay products—</i>								
Nova Scotia.....	836,452	140,551	77,394	1,054,397	791,818	149,547	84,692	1,026,057
New Brunswick.....	90,271	16,536	8,734	115,541	210,039	26,547	21,519	258,105
Quebec.....	9,644,445	961,729	788,032	11,394,206	10,512,410	1,067,893	895,997	12,476,300
Ontario.....	11,417,193	1,510,741	1,507,104	14,435,038	11,068,103	1,687,749	1,565,464	14,321,316
Manitoba.....	166,670	58,610	120,958	346,238	274,108	74,989	105,050	454,147
Saskatchewan.....	873,246	76,443	80,426	1,030,115	895,884	72,424	134,132	1,102,440
Alberta.....	2,005,553	339,726	525,214	2,870,493	2,249,900	299,277	599,579	3,148,756
British Columbia.....	905,604	187,698	133,873	1,227,175	1,054,296	181,846	166,793	1,402,935
Canada.....	25,939,434	3,292,634	3,241,735	32,473,803	27,056,558	3,590,272	3,573,226	34,190,056

*Includes 1 firm in New Brunswick.

Table 336.—Employees, Salaries and Wages in the Clay Products Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1928				\$	\$	\$
Nova Scotia.....	11	212	223	31,035	154,543	185,578
New Brunswick.....	4	48	52	18,548	33,586	52,134
Quebec.....	81	1,140	1,221	153,694	1,003,243	1,156,937
Ontario.....	200	2,261	2,461	437,193	2,204,257	2,641,450
Manitoba.....	12	265	277	26,090	117,688	143,778
Saskatchewan.....	13	140	153	28,834	131,222	160,056
Alberta.....	29	445	474	68,941	443,324	512,265
British Columbia.....	19	315	334	41,874	287,326	329,200
Canada.....	369	4,826	5,195	806,299	4,375,189	5,181,398
1929						
Nova Scotia.....	18	245	263	30,953	198,434	229,387
New Brunswick.....	8	89	97	9,965	58,962	68,927
Quebec.....	91	1,168	1,259	195,371	1,037,432	1,232,803
Ontario.....	216	2,442	2,658	518,533	2,283,363	2,801,896
Manitoba.....	12	198	210	27,350	152,931	180,281
Saskatchewan.....	19	164	183	40,180	161,188	201,368
Alberta.....	26	443	469	67,505	435,057	502,562
British Columbia.....	25	366	391	51,588	388,202	439,790
Canada.....	415	5,115	5,530	941,445	4,785,569	5,727,014

*See note page 37.

Table 337.—Wage-Earners in the Clay Products Industry in Canada, by Months and by Industries, 1929

Month	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	Total
January.....	2,161	348	166	147	16	2,838
February.....	1,814	290	171	156	14	2,445
March.....	2,347	242	202	159		2,950
April.....	3,318	359	206	160		4,043
May.....	4,358	386	225	154		5,123
June.....	4,808	386	230	156	6	5,586
July.....	4,892	398	223	154	8	5,675
August.....	4,878	399	215	154	8	5,654
September.....	4,473	394	221	114	8	5,210
October.....	3,950	392	222	135	8	4,707
November.....	3,563	379	220	137	8	4,307
December.....	2,893	370	174	153	8	3,598

IMPORTED-CLAY PRODUCTS

In continuance of the custom followed in previous mineral production reports, a short review of the imported-clay products industry is given herewith.

Manufactures in Canada from imported clays amounted in value to \$3,373,038 in 1929. This output was 37 per cent above the corresponding figure of \$2,458,801 for 1928 and marked the fifth year in succession in which a new high production value for the industry was established. Among the products made from clays especially imported for the purpose, were porcelain insulators valued at \$2,065,404; firebrick and stove lining at \$362,236; pottery at \$69,140; and other commodities such as sanitary earthenware, sewer pipe, ceramic floor tile, etc., worth \$875,909.

Figures on this industry for 1929 cover the operations of 15 plants of which 11 were located in Ontario and 4 in Quebec. These concerns employed a capital of \$3,472,052 and gave work to a monthly average of 872 persons throughout the year. Payments for salaries and wages totalled \$1,112,881. Purchased materials cost \$992,150, and the value added by manufacturing processes was 2,380,888. Production from 11 plants in Ontario amounted in value to \$2,465,081, and output from 4 plants in Quebec was worth \$909,957.

At St. John's, Quebec, two plants produced sanitary ware from imported ball and china clays, while a third firm manufactured refractory products and vitrified sewer pipe. Refractory products were also made by one firm at Montreal, two at Toronto, one at Port Robinson and one at Hamilton. Earthenware was produced at Hamilton, Ontario. Porcelain insulators were manufactured in Ontario at Georgetown, Hamilton, Niagara Falls and Peterborough. Artware was produced at Oshawa and a plant at Kingston produced ceramic floor tile.

Table 338.—Capital Employed in the Imported-Clay Products Industry in Canada, 1928 and 1929

	1928	1929
	\$	\$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools.....	1,787,149	1,852,882
Cost of supplies and stocks on hand.....	642,919	621,365
Cash, trading and operating accounts and bills receivable.....	638,494	997,805
Total.....	3,068,562	3,472,052

Table 339.—Employees, Salaries and Wages in the Imported-Clay Products Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
1928						\$	\$	\$
Quebec.....	27	4	237	6	274	73,431	292,824	366,255
Ontario.....	38	11	331	42	422	144,464	380,406	524,870
Canada.....	65	15	568	48	696	217,895	673,230	891,125
1929								
Quebec.....	22	4	249	6	281	62,038	305,351	367,389
Ontario.....	45	20	449	77	591	188,797	556,695	745,492
Canada.....	67	24	698	83	872	250,835	862,046	1,112,881

* See note page 37.

Table 340.—Wage-Earners in the Imported-Clay Products Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January.....	526	713	July.....	636	806
February.....	524	737	August.....	635	817
March.....	529	745	September.....	665	816
April.....	550	760	October.....	664	911
May.....	597	779	November.....	651	798
June.....	594	778	December.....	640	786

LIME

Statistics obtained during the census of 1871 show 1,010 lime kilns in operation in Canada. These kilns were located in Nova Scotia, New Brunswick, Quebec and Ontario. Capital invested in plant and equipment as recorded during that year was \$128,508, and employees numbered 2,042, earning \$157,943; the value of lime produced was \$502,156. A substantial growth was shown in this industry according to data obtained ten years later; active kilns had increased to 1,274 with a corresponding advance in capital investment to a total of \$309,354. Employment in 1881 was furnished 2,537 wage-earners who received \$203,631 and the value of lime produced was \$707,132.

Of the total amount of lime produced in 1929, chemical works used nearly 45 per cent or 298,364 tons; pulp and paper mills consumed 103,171 tons or about 15 per cent, and a slightly smaller quantity went to the building trades. Smelters used somewhat more than 7 per cent and of the remaining 18 per cent, small quantities were used in sugar refineries, tanneries, and for agricultural purposes, while about 15 per cent was sold for unspecified uses.

Considerably more than half the quantity of lime produced in Canada during 1929 was produced in the province of Ontario and almost 25 per cent was produced in Quebec. In the order named the following provinces produced the remainder: Nova Scotia, British Columbia, Manitoba, New Brunswick and Alberta.

Table 341.—Production of Lime in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Bushels	Value	Year	Bushels	Value
		\$			\$
1920.....	9,427,334	3,818,553	1925.....	10,256,542	3,387,652
1921.....	6,879,066	2,781,197	1926.....	11,825,736	3,781,484
1922.....	8,972,971	3,165,005	1927.....	12,707,221	3,923,388
1923.....	10,035,319	3,266,608	1928.....	14,539,686	4,534,568
1924.....	9,136,952	3,178,541	1929.....	19,259,639	5,908,610

Table 342.—Production of Lime in Canada, 1928 and 1929, Showing Purposes for Which Sold or Used

Purpose for which sold or used	1928				1929			
	Quicklime		Hydrated lime		Quicklime		Hydrated lime	
	Bushels	Value	Tons	Value	Bushels	Value	Tons	Value
		\$		\$		\$		\$
Building trades.....	1,330,657	478,496	43,620	572,571	45,904	469,742	53,025	694,669
Chemical works.....	4,380,972	1,282,493	1,187	14,596	297,855	2,397,989	509	5,799
Glass works.....	190,400	55,757			8,509	70,695	500	6,240
Smelters.....	1,086,657	191,540	108	1,230	48,689	209,861		
Pulp and paper mills.....	2,879,657	718,534	4,375	39,966	97,071	691,849	6,100	56,754
Sugar refineries.....	288,171	80,572			8,279	70,707		
Tanneries.....	98,943	28,949	366	3,342	1,963	16,398	110	1,171
Agricultural uses (fertilizer).....	20,171	4,657	2,168	18,057	365	2,440	2,396	21,274
Dealers (uses unspecified).....	976,943	292,007	17,808	204,917	44,651	433,883	17,951	261,066
Other consumers.....	1,002,286	419,186	10,337	127,698	27,297	344,595	12,913	153,478
Total sold or used.....	12,254,857	3,552,191	79,969	982,377	580,583	4,708,159	93,504	1,200,451

Table 343.—Production of Lime in Canada, by Provinces, 1927-1929

Province		Quicklime		Hydrated Lime		Total	
		Sold or used		Sold or used		Sold or used	
		Tons	Value	Tons	Value	Tons	Value
			\$		\$		\$
Nova Scotia.....	1927	30,552	100,134	10	120	30,562	100,254
	1928	35,534	167,386	620	8,490	36,154	175,876
	1929	41,001	143,787	1,000	10,400	42,001	154,187
New Brunswick.....	1927	12,009	148,321			12,009	148,321
	1928	11,236	130,484	25	300	11,261	130,784
	1929	11,766	135,981	3,752	38,572	15,518	174,553
Quebec.....	1927	97,077	725,876	10,576	80,789	107,653	806,665
	1928	102,859	795,999	11,271	100,783	114,130	896,782
	1929	157,414	1,183,148	9,473	81,046	166,892	1,264,194
Ontario.....	1927	198,383	1,657,552	44,749	540,687	243,132	2,198,239
	1928	228,101	1,870,476	49,085	597,367	277,186	2,467,843
	1929	314,243	2,624,284	55,915	740,127	370,158	3,364,411
Manitoba.....	1927	14,741	123,831	7,973	122,448	22,714	246,279
	1928	20,006	173,127	8,331	146,572	28,337	319,699
	1929	22,178	186,377	10,068	174,727	32,246	361,104
Alberta.....	1927	4,571	46,947			4,571	46,947
	1928	6,672	69,588			6,672	69,588
	1929	7,681	79,569			7,681	79,569
British Columbia.....	1927	16,175	279,230	7,936	97,453	24,111	376,683
	1928	24,512	345,131	10,637	128,865	35,149	473,996
	1929	26,300	355,013	13,291	155,579	39,591	510,592
Canada.....	1927	373,509	3,081,891	71,244	841,497	444,753	3,923,388
	1928	428,920	3,552,191	79,969	982,377	508,889	4,534,568
	1929	580,583	4,708,159	93,504	1,200,451	674,087	5,908,610

Table 344.—Imports into Canada and Exports of Lime, 1927-1929

Item	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Imports.....	5,784	70,075	5,417	64,811	4,448	49,305
Exports.....	21,069	367,939	20,043	357,085	24,238	428,209

Table 345.—Capital Employed in the Lime Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	56,495	2,600	3,200	62,295	57,515	4,944	6,297	68,756
New Brunswick.....	107,500	28,450	11,500	147,450	112,500	25,500	28,500	166,500
Quebec.....	1,279,684	179,843	306,665	1,766,192	1,612,404	174,574	225,445	2,012,423
Ontario.....	2,177,855	240,340	244,043	2,662,238	2,466,818	230,258	113,708	2,810,784
Manitoba.....	487,061	46,046	3,230	536,337	548,563	44,002	3,043	595,608
Alberta.....	146,741	30,123	21,989	198,853	152,254	33,213	29,676	215,143
British Columbia.....	1,335,840	93,260	149,614	1,578,714	1,375,029	70,358	90,076	1,535,463
Canada.....	5,591,176	629,662	740,241	6,952,079	6,325,083	582,849	496,745	7,404,677

Table 346.—Employees, Salaries and Wages in the Lime Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1928						
New Brunswick*.....	1	51	52	1,800	57,372	59,172
Quebec.....	6	58	64	16,540	47,501	64,041
Ontario.....	22	297	319	37,810	272,220	310,039
Manitoba.....	41	443	484	81,830	468,422	550,252
Alberta.....	7	112	119	12,968	82,684	95,652
British Columbia.....	4	28	32	5,700	31,868	37,568
Canada.....	16	129	145	28,034	171,316	199,400
1929	100	1,118	1,218	184,732	1,131,383	1,316,115
Nova Scotia.....	1	54	55	900	49,570	50,470
New Brunswick.....	9	74	83	15,840	57,942	73,782
Quebec.....	12	394	407	19,357	362,162	381,519
Ontario.....	53	410	463	67,352	427,234	494,586
Manitoba.....	9	137	146	13,579	98,572	112,151
Alberta.....	4	29	33	5,500	35,604	41,104
British Columbia.....	20	175	195	36,076	203,404	239,480
Canada.....	109	1,273	1,382	158,604	1,234,488	1,393,092

* See note page 37.

Table 347.—Wage-Earners in the Lime Industry in Canada, by Provinces and by Months, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January.....	53	57	371	411	87	24	183	1,186
February.....	53	54	341	403	88	24	182	1,145
March.....	56	53	299	350	97	22	195	1,072
April.....	52	52	366	372	114	29	189	1,174
May.....	53	65	395	426	134	31	184	1,288
June.....	52	86	465	383	157	31	177	1,341
July.....	48	80	429	394	162	34	182	1,329
August.....	47	77	378	389	160	30	172	1,253
September.....	48	76	398	384	153	26	186	1,271
October.....	52	81	403	390	144	30	188	1,288
November.....	48	85	354	333	142	27	178	1,167
December.....	48	68	325	281	134	29	164	1,049

SAND AND GRAVEL

Production statistics for the sand and gravel industry in Canada were first collected in 1912. Prior to that year the only data available consist of Customs' records of sand and gravel exported. In 1886 exportations amounted to 124,865 tons; twenty-four years later exports had risen to 624,824 tons appraised at \$407,974. During 1912, production was valued at \$1,512,099 and wages paid to the 875 pit employees totalled \$527,425. It was not until 1916 that tonnage statements were obtained from the operators in this industry; the total for that year amounted to 8,156,207 tons at \$1,838,320. Since 1918, the annual production has exceeded the 10-million-ton mark. The highest market valuation per ton for this material was received in 1920, when 11,530,795 tons were sold for \$4,201,067. During that year, the 186 producers employed 1,546 men whose total earnings were \$1,343,212.

Sand and gravel production in Canada during 1929 amounted to 27,846,945 tons valued at \$7,317,814 as compared with 28,102,917 tons at \$5,809,431 produced in 1928.

Imports of sand and gravel into Canada during the year totalled 269,426 tons worth \$216,918. Silica sand imported for glass and carborundum manufacture and for use in steel foundries amounted to 233,963 tons at \$490,558, including 197,997 tons from the United States, 35,913 tons from Belgium, and small shipments from the United Kingdom and France.

In 1929 the sand and gravel industry in Canada furnished employment to 8,758 persons whose earnings totalled \$2,505,225. Excluding statistics regarding the sand and gravel operations of railway companies, the fixed and current assets of the 541 other operators in this industry amounted to \$9,154,055. Fuel and electricity used in 1929 cost \$285,491.

Table 348.—*Production of Sand and Gravel in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....	11,530,795	4,201,067	1925.....	11,018,647	3,220,410
1921.....	11,574,862	2,537,249	1926.....	17,112,798	4,941,434
1922.....	11,666,374	3,502,935	1927.....	22,952,819	6,055,601
1923.....	12,752,515	3,016,518	1928.....	28,102,917	5,809,431
1924.....	11,603,500	3,181,083	1929.....	27,846,945	7,317,814

Table 349.—Production in Canada, Imports and Exports of Sand and Gravel, 1927-1929

Kind	1927		1928		1929		
	Tons	Value	Tons	Value	Washed or screened	Bank or Pit-run	Total value
		\$		\$	Tons	Tons	\$
PRODUCTION—							
Sand—							
Moulding sand.....	86,541	56,017	42,060	46,404	7,659	56,798	50,308
Building sand and sand for concrete, roads, etc.....	4,416,014	1,162,936	2,380,366	829,659	2,207,745	501,544	1,181,261
Filter sand.....			4,500	18,000			
Core sand*					3,000	8,015	10,168
Other sand (including blast, core and engine sands).....	139,772	47,117	111,326	31,724		324,235	63,097
Sand and Gravel—							
Sand and gravel for railway ballast.....	8,294,927	1,167,916	11,981,398	1,198,360	23,041	11,175,050	1,257,424
Sand and gravel for concrete, roads, etc..	9,309,091	3,259,678	12,530,310	3,061,139	3,247,771	9,307,323	4,087,132
Filter gravel.....			4,000	16,000			
Crushed gravel.....	706,474	361,937	1,048,957	608,145	785,618	199,146	668,424
Total.....	22,952,819	6,055,601	28,102,917	5,809,431	6,274,834	21,572,111	7,317,814
IMPORTS—							
Sand, silica for glass and carborundum manufacture, etc.....	148,831	346,138	154,384	332,338	233,967		490,558
Sand and gravel, n.o.p.....	289,741	200,470	588,211	275,322	269,426		216,918
Total.....	438,572	546,608	742,595	607,660	503,393		707,476
EXPORTS.....	637,627	177,999	797,111	232,422	1,903,312		441,798

*Included with other sand in 1927 and 1928.

Table 350.—Production of Sand and Gravel in Canada, by Railway Operators, 1927-1929

Kind	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$
Sand—						
Moulding sand.....	1,256	1,669			425	225
Building sand and sand for concrete, roads, etc.....	13,018	10,112	71,701	12,477	7,817	3,082
Other sand (including blast, core and engine sands).....	83,261	13,127	95,100	15,896	301,653	50,562
Sand and Gravel—						
Sand and gravel for railway ballast.....	7,729,663	937,653	11,957,131	1,195,710	10,534,345	1,236,364
Sand and gravel for concrete, roads, etc....	130,795	50,660	1,473,022	160,567	664,773	68,161
Total.....	7,957,993	1,013,221	13,596,954	1,384,656	11,509,013	1,358,394

Table 371.—Production of Sand and Gravel in Canada, by Operators Other than Railways, 1927-1929

Kind	1927		1928		1929		
	Tons	Value	Tons	Value	Washed or screened	Bank or pit-run	Value
		\$		\$	Tons	Tons	\$
Sand—							
Moulding sand.....	85,285	54,348	42,060	46,404	7,659	56,373	50,083
Building sand and sand for concrete, roads, etc.....	4,402,996	1,152,624	2,308,665	817,182	2,207,745	493,727	1,178,179
Filter sand.....			4,500	18,000			
Core sand.....					3,000	8,015	10,168
Other sand (including blast, core and engine sands).....	56,511	33,990	16,226	15,828		22,582	12,535
Sand and Gravel—							
Sand and gravel for railway ballast.....	565,264	230,263	24,267	2,650	23,041	640,705	21,060
Sand and gravel for concrete, roads, etc.....	9,178,296	3,209,018	11,057,288	2,900,572	3,247,771	8,642,550	4,018,971
Filter gravel.....			4,000	16,000			
Crushed gravel.....	706,474	361,937	1,048,957	608,145	785,618	199,146	668,424
Total.....	14,994,826	5,042,380	14,505,963	4,424,781	6,274,834	10,063,098	5,959,420

Table 352.—Production of Sand and Gravel in Canada, by Provinces, 1927-1929

Kind	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1927								
Sand—								
Moulding sand.....tons	30			85,965	435			111
\$	75			54,806	453			683
Building sand.....tons	67		3,328,414	980,863	56,548	9,365	7,086	33,671
\$	25		696,691	426,118	19,843	7,566	2,833	9,860
Other sand (including blast, core and engine sands).....tons	3,440	1,295	48,228	53,647	4,057	18,850	3,375	6,880
\$	2,591	370	6,746	31,470	1,196	2,450	563	1,731
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	128,855	368,228	1,493,512	1,934,930	995,844	1,426,247	1,149,166	798,645
\$	16,144	114,460	288,172	198,602	130,963	214,619	104,641	100,315
Sand and gravel for concrete, roads, etc.....tons	680,584	18,543	3,744,536	3,823,518	248,648	37,689	215,737	539,836
\$	503,888	3,938	879,098	1,395,948	65,626	20,665	161,083	229,432
Crushed gravel.....tons			1,048	633,840	28,548	25,650	17,388	
\$			10,224	298,785	10,574	17,800	24,554	
Total.....tons	812,976	388,066	8,615,738	7,512,763	1,333,580	1,517,801	1,392,752	1,379,143
\$	522,723	118,768	1,880,931	2,405,729	228,655	263,100	293,674	342,021
1928								
Sand—								
Moulding sand.....tons	30			41,505	162			363
\$	75			44,241	120			1,968
Building sand and sand for concrete, roads, etc.....tons	305	1,323	1,119,304	1,063,231	56,788	4,085	21,369	113,961
\$	35	132	354,036	410,262	23,397	872	9,286	31,639
Filter sand.....tons			4,500					
\$			18,000					
Other sand (including blast, core and engine sands).....tons	2,657	2,807		15,802	49,776	21,654	8,343	10,287
\$	2,391	1,400		13,448	7,638	3,524	813	2,510
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	85,749	451,766	2,337,895	2,931,604	1,272,009	1,601,486	1,875,077	1,425,812
\$	13,156	44,468	178,594	247,339	154,260	196,054	185,409	179,440
Sand and gravel for concrete, roads, etc.....tons	18,525	24,223	4,662,133	5,664,392	231,760	537,549	639,671	752,057
\$	11,446	6,782	1,123,300	1,115,246	60,665	186,025	261,703	295,972
Filter gravel.....tons			4,000					
\$			16,000					
Crushed gravel.....tons	189,000	11,352	8,509	672,874	43,434	60,750	31,248	31,790
\$	84,600	1,401	11,352	399,771	15,926	45,000	32,555	18,140
Total.....tons	296,266	491,471	8,136,341	10,389,408	1,653,929	2,225,524	2,575,708	2,334,270
\$	111,103	54,183	1,701,282	2,239,397	262,006	431,475	489,496	529,669
1929								
Sand—								
Moulding sand.....tons	60		170	62,738	1,028			461
\$	150		106	48,047	895			1,110
Building sand and sand for concrete, roadwork, etc.....tons	102		1,084,178	1,454,023	60,499	3,244	36,902	70,341
\$	169		419,798	703,067	23,538	1,350	16,154	17,185
Core sand.....tons	3,176			7,362	477			
\$	2,858			6,826	484			
Other sand (including blast sand, engine sand, etc.).....tons		1,634	25,444	23,694	155,953	1,175	6,851	109,484
\$		574	8,152	8,308	24,771	279	1,290	19,723
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	221,887	498,451	1,146,095	2,785,954	1,278,089	2,642,881	1,097,037	1,527,697
\$	31,235	32,478	226,396	281,806	180,287	293,730	91,349	120,143
Sand and gravel for concrete, road building, etc.....tons	68,557	19,271	3,932,494	6,353,889	163,151	795,379	550,257	672,096
\$	70,729	12,313	872,822	1,968,918	36,027	352,287	299,948	474,088
Crushed gravel.....tons	38,817	6,501	14,850	670,908	122,888	54,000	30,883	45,917
\$	46,227	802	7,425	445,407	56,428	40,000	39,252	32,883
Total.....tons	332,599	525,857	6,203,231	11,358,568	1,782,085	3,496,679	1,721,930	2,425,996
\$	151,368	46,167	1,534,699	3,462,379	322,430	687,646	447,993	665,132

Table 353.—Capital Employed in the Sand and Gravel Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Quebec.....	1,076,843	36,477	120,501	1,233,821	993,003	41,362	125,777	1,160,142
Ontario.....	4,180,122	66,997	252,415	4,499,534	5,884,519	141,595	372,473	7,398,587
Manitoba.....	314,051	24,262	124,590	462,903	355,566	34,182	164,268	554,016
Saskatchewan.....	80,000	3,000		83,000	80,000	3,000		83,000
Alberta.....	323,000	4,800	2,000	329,800	325,000	4,800	2,000	331,800
British Columbia.....	1,139,825	15,305	18,947	1,174,077	577,344	10,296	38,870	626,510
Canada.....	7,113,841	159,841	518,453	7,783,135	8,215,432	235,235	703,388	9,154,055

Table 354.—Employees, Salaries and Wages in the Sand and Gravel Industry by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1928						
Nova Scotia.....		195	195		47,787	47,787
New Brunswick.....		74	74		13,449	13,449
Quebec.....	10	4,635	4,645	17,902	657,122	675,024
Ontario.....	60	1,295	1,355	127,089	863,525	990,614
Manitoba.....	8	275	283	14,560	101,413	115,973
Saskatchewan.....	4	473	477	7,000	148,898	155,898
Alberta.....	1	386	387	1,700	177,412	179,112
British Columbia.....	12	403	415	31,494	259,117	290,611
Canada.....	95	7,736	7,831	199,745	2,268,723	2,468,468
1929						
Nova Scotia.....		167	167		54,863	54,863
New Brunswick.....		74	74		15,160	15,160
Quebec.....	18	5,782	5,800	22,203	743,148	765,351
Ontario.....	60	1,065	1,125	113,451	826,491	939,942
Manitoba.....	8	275	283	16,785	112,558	129,343
Saskatchewan.....	4	550	554	8,000	185,031	193,031
Alberta.....	2	366	368	2,800	148,579	151,379
British Columbia.....	11	376	387	26,595	229,561	256,156
Canada.....	103	8,655	8,758	189,834	2,315,391	2,505,225

* See note page 37.

Table 355.—Wage-Earners in the Sand and Gravel Industry in Canada, by Months and by Provinces, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
January.....		1	96	195	4	2	44	143	465
February.....	2	1	54	294	14	2	44	135	546
March.....	2	1	103	375	9	2	84	195	771
April.....	47	1	167	692	60	102	167	240	1,476
May.....	74	12	542	877	131	228	233	237	2,334
June.....	147	35	5,554	908	154	317	169	221	7,505
July.....	114	43	5,519	987	164	236	141	233	7,437
August.....	83	30	424	849	199	168	185	168	2,106
September.....	78	43	382	839	48	142	117	139	1,788
October.....	54	11	305	792	51	60	127	164	1,564
November.....	23	1	226	658	58	19	63	121	1,169
December.....	5	1	84	435	14	2	5	84	630

SAND-LIME BRICK

Because of its association with other building materials, data regarding the production of sand-lime brick are included in this report. Statistics relating to sand-lime brick are not included in the totals for structural materials industries as both the sand and lime used have been so recorded; production of sand-lime brick is regarded as a manufacturing operation and therefore is shown in the report on the *Manufactures of the Non-Metallic Minerals*, issued annually by the Bureau.

Production from the sand-lime brick industry in Canada during 1929 was valued at \$953,726, a decline of 14 per cent from the record established in the previous year at \$1,112,466, but 15 per cent higher than the average reported for the five-year period, 1924-1928. Output of sand-lime brick during the year under review amounted 78,361,000, worth \$953,726 as against a total of 82,271,000, valued at \$1,038,510 in 1928 when the balance of the output consisted of hollow building blocks.

In 1929 a total of 12 plants were operating in Canada, 7 of which were located in Ontario, 2 in Quebec, 2 in Manitoba, and 1 in Alberta. These concerns employed a capital of \$2,356,726 and distributed \$341,005 in salaries and wages to a monthly average of 304 employees. Purchased materials cost \$264,465 and the value added by manufacturing processes was \$689,261.

Table 356.—Sand-Lime Brick Manufactured in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	M	\$	M	\$	M	\$
Quebec.....	8,182	96,926	14,122	203,249	8,745	114,617
Ontario.....	61,297	721,485	61,506	745,719	60,400	708,584
Manitoba.....	3,385	46,500	6,643	89,542	7,150	99,527
Alberta.....					2,066	30,998
Total.....	72,864	864,911	82,271	1,038,510	78,361	953,726

SLATE

Slate deposits located along the south shore of the St. Lawrence river in Quebec, were operated for the first time in 1854. Production from these deposits reached a maximum in point of value in 1889 when 6,935 tons valued at \$119,160 were shipped. These shipments consisted of roofing slates, mantles and slabs. Quarrying operations were carried on at the Quebec deposits up to 1923, in which year 1,836 tons of crushed green and red slate were shipped for use in the manufacture of roofing material. No production has been recorded since that date.

During 1908, a slate quarry was operated at Jarvis Inlet, British Columbia.

Table 357.—Production of Slate in Canada, 1886-1929

Year	Tons*	Value	Year	Tons*	Value	Year	Tons*	Value
		\$			\$			\$
1886.....	5,345	64,675	1899.....		33,406	1912.....	1,894	8,939
1887.....	7,357	89,000	1900.....		12,100	1913.....	1,432	6,444
1888.....	5,314	90,689	1901.....	715	9,980	1914.....	1,075	4,837
1889.....	6,935	119,160	1902.....		19,200	1915.....	397	2,039
1890.....	6,368	100,250	1903*	5,510	22,040	1916.....	1,262	6,223
1891.....	5,000	65,000	1904.....	5,277	23,247	1917.....	1,422	7,789
1892.....	5,180	69,070	1905.....		21,568	1918.....	933	5,124
1893.....	7,112	90,825	1906.....		24,446	1919*	1,632	10,853
1894.....		75,550	1907.....	4,335	20,056	1920.....	(a)	14,200
1895.....		58,900	1908.....	2,950	13,496	1921.....	(b)	22,325
1896.....		53,370	1909.....	4,000	19,000	1922.....	1,899	14,871
1897.....		42,800	1910.....	3,959	18,492	1923.....	1,836	17,289
1898.....		40,791	1911.....	1,833	8,248	1924-1929.....		
						Total.....		1,326,292

*1903 to 1919 inclusive quantity recorded in squares.

(a) 1,532 squares valued at \$12,362 and 240 tons crushed slate at \$1,838.

(b) 415 squares valued at \$4,063 and 2,232 tons crushed slate at \$18,262.

Table 358.—Imports of Slate into Canada, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		\$		\$		\$
Roofing.....Squares	6,427	73,006	7,453	95,468	9,504	123,793
School-writing.....		72,101		83,248		96,296
Pencils.....		7,025		8,036		9,398
Mantles and manufactures of slate, n.o.p.		53,934		52,544		67,151
Total.....		203,066		239,296		296,635

THE STONE INDUSTRY IN CANADA

Including (1) The Stone Quarrying Industry and (2) The Monumental and Ornamental Stone Industry

(1) PRIMARY PRODUCTION—The Stone Quarrying Industry

Statistics of the stone industry as set forth in the general tables of this report have been confined to quarrying operations and to the production of dressed stone when this operation is carried on in conjunction with the quarrying. The kinds of stone quarried in Canada include granite (trap-rock, syenite and other igneous rock), limestone, marble and sandstone. In 1929, granite was produced in Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia; limestone was obtained in all provinces except Prince Edward Island and Saskatchewan; marble was quarried in Nova Scotia, Quebec, Manitoba and British Columbia; and the sandstone output had its source in Nova Scotia, New Brunswick, Quebec, Ontario, Alberta and British Columbia.

The value of limestone production has advanced from a total of \$2,139,691 in 1909 to \$8,172,681 in 1929. During the latter year 79.2 per cent of the production was marketed as crushed stone for concrete aggregates, road metal and similar uses; 1.6 per cent as building, monumental and ornamental stone; 5.8 per cent for flux; 4 per cent for use in sugar factories and chemical works; the remainder, 9.4 per cent consisted of rubble and riprap and small tonnages of flag-stones, agricultural limestone and poultry grit. Considerable tonnages of limestone are also quarried for use in the production of cement and lime.

The production of marble in Canada during the period 1886-1896 was relatively small, totalling 3,391 tons valued at \$45,837. From 1897 to 1907, inclusive, records do not show any production of marble in Canada. With the opening of quarries at Philipsburg and South Stukely, Quebec; at Bancroft and Marble Bluff, Ontario; in the Pas area, Manitoba; and on Nootka Sound and Lardeau, British Columbia, the production became of considerable importance in 1908 marble shipments were valued at \$125,000 but in 1912 an advance to a total valuation of \$260,764 was made. The maximum output value for the industry of \$521,572 was reached in 1926 when 3,442 tons of marble for building purposes and 1,853 tons of crushed marble were shipped from Quebec and Ontario deposits. The 1929 production totalled 14,012 tons valued at \$414,062.

Table 359.—Production of Granite in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....		1,508,916	1925.....	971,718	2,014,535
1921.....	319,398	937,894	1926.....	1,064,423	1,574,627
1922.....	457,925	1,486,250	1927.....	730,049	1,383,557
1923.....	398,432	1,159,303	1928.....	1,195,810	2,366,946
1924.....	419,971	1,013,345	1929.....	1,728,165	3,080,815

Table 360.—Production of Limestone and Sandstone in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Limestone		Sandstone		Year	Limestone		Sandstone	
	Tons	Value	Tons	Value		Tons	Value	Tons	Value
		\$		\$			\$		\$
1920.....		5,665,693		165,149	1925.....	4,643,853	5,049,563	87,502	145,757
1921.....	3,322,024	5,155,046	28,426	78,036	1926.....	5,283,745	5,657,328	44,127	112,547
1922.....	3,152,124	4,175,941	25,221	80,908	1927.....	6,438,379	7,145,917	132,799	232,793
1923.....	3,687,663	4,475,921	22,766	66,547	1928.....	6,949,420	7,267,437	100,951	223,236
1924.....	4,249,061	4,831,684	94,603	240,273	1929.....	7,720,840	8,172,681	159,407	398,974

Table 361.—Production of Marble in Canada, 1920-1929

(For the years 1886 to 1919 see Annual Report Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		\$			\$
1920.....		240,593	1925.....	3,046	254,922
1921.....	1,650	172,720	1927.....	5,295	521,572
1922.....	1,912	231,894	1927.....	5,209	503,037
1923.....	2,473	201,518	1928.....	7,753	414,682
1924.....	4,379	322,455	1929.....	14,012	414,062

Table 362.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1928

Item	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—								
Rough..... tons	1,183	55	99,488	110,106	11,227		2,027	224,086
\$	14,194	633	283,947	107,754	52,805		14,541	423,874
Dressed..... tons	12	1,478	87,134	58,669	9,033	158	350	106,834
\$	1,349	19,201	1,262,258	89,287	335,121	9,500	15,000	1,727,716
Monumental and ornamental—								
Rough..... tons	256	817	10,675	115			870	12,733
\$	3,328	16,548	126,327	1,869			31,280	179,352
Dressed..... tons	580	458	708	80			1,055	2,861
\$	36,618	30,833	16,737	2,193			51,300	137,681
Flagstone..... tons			300	1,636				1,936
\$			218	14,924				15,142
Curbstone..... tons		133	21,404					21,537
\$		2,250	118,847					121,097
Paving blocks..... tons		119	22,531	5,433				28,093
\$		1,270	138,842	44,649			200	184,961
Limestone, for flux..... tons	70,500		1,331	155,433			29,649	256,913
\$	72,765		1,723	117,863			24,181	216,532
Limestone for sugar factories, chemical works, etc..... tons		15,017	159,724	45,547		2,177	37,259	259,724
\$		23,525	133,657	55,085		3,720	51,985	267,975
Poultry grit..... tons			100	10		5	172	287
\$			655	50		30	1,159	1,894
Ground limestone for agricultural use..... tons	1,850	9,415	11,133	2,285			279	24,962
\$	6,555	28,245	42,375	2,285			1,813	81,273
Rubble and riprap..... tons	8,115	12,500	359,602	98,718	95,400		45,876	620,211
\$	14,991	14,596	351,495	91,807	96,513		43,940	613,342
Crushed..... tons	38,672	6,340	2,268,062	4,103,917	120,204	2,670	153,892	6,693,757
\$	63,975	5,880	2,422,119	3,517,799	123,778	11,490	156,421	6,301,462
Total..... tons	121,168	46,332	2,992,192	4,581,929	235,864	5,010	271,439	8,253,934
\$	213,775	142,981	4,849,200	4,041,568	608,217	24,740	391,820	10,272,301
Per cent of total..... Quantity	1.47	0.57	36.25	55.51	2.85	0.06	3.29	100.00
Value	2.08	1.39	47.21	39.34	5.92	0.24	3.82	100.00

Table 363.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1929

Item		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—									
Rough.....	tons	5,487	194	56,959	21,194	35,015		3,878	122,727
	\$	71,027	4,673	271,148	111,285	210,891		42,893	711,917
Dressed.....	tons	25	1,592	45,420	3,971	12,261		208	63,522
	\$	1,000	87,624	1,387,474	79,481	558,505	12,500	4,200	2,130,784
Monumental and ornamental—									
Rough.....	tons	157	882	8,226	133	35		196	9,629
	\$	1,844	14,752	102,667	2,745	450		5,282	127,740
Dressed.....	tons	430	674	1,694				984	3,852
	\$	11,760	42,353	46,628				51,165	154,532
Flagstone.....	tons			114	1,645				1,759
	\$			114	17,541				17,655
Curbstone.....	tons		301	35,321		39		123	35,784
	\$		3,614	221,748		393		1,010	226,765
Paving blocks.....	tons		1,572	10,717	5,717				18,009
	\$		15,675	93,123	50,479				159,327
Limestone, for flux.....	tons	106,692		206	318,910		743	27,046	453,597
	\$	109,509		309	243,868		1,500	21,613	376,799
Limestone for sugar factories, chemical works, etc.....	tons		17,580	90,638	155,068		2,906	52,844	319,036
	\$		28,600	97,228	137,947		5,242	81,380	350,397
Poultry grit.....	tons				3,000			56	3,056
	\$				12,000			522	12,522
Ground limestone for agricultural use.....	tons	1,525	2,130	22,790	2,127			172	28,744
	\$	5,875	4,260	59,288	1,702			708	71,833
Rubble and riprap.....	tons	6,724		635,567	130,844	25,463		148,475	947,073
	\$	11,439		563,365	111,040	20,365		135,195	841,404
Crushed.....	tons	143,666	2,427	2,576,819	4,596,993	119,296	1,326	175,109	7,615,636
	\$	163,768	3,419	2,474,767	3,965,549	104,413	5,804	167,637	6,884,857
Total.....	tons	264,706	27,352	3,484,471	5,239,672	192,109	5,183	408,931	9,622,424
	\$	376,222	204,970	5,317,859	4,736,263	895,017	24,516	511,655	12,066,532
Per cent of total.....	Quantity	2.75	0.28	36.22	54.45	2.00	0.05	4.25	100.00
	Value	3.12	1.70	44.07	39.25	7.42	0.23	4.24	100.00

Table 364.—Production of Stone in Canada, by Kinds and by Provinces, 1928 and 1929

Province	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1928		\$		\$		\$		\$
Nova Scotia.....	39,360	102,295	72,350	79,320	160	2,975	9,298	29,185
New Brunswick.....	5,485	66,435	30,772	57,650			10,075	18,896
Quebec.....	230,660	1,241,668	2,684,305	3,116,753	6,643	380,307	70,584	110,472
Ontario.....	605,275	566,601	3,967,098	3,421,064			9,556	53,903
Manitoba.....	114,000	114,000	121,864	494,217				
Alberta.....			4,852	15,240			158	9,500
British Columbia.....	201,030	275,947	68,179	83,193	950	31,400	1,280	1,280
Canada.....	1,195,810	2,366,946	6,949,420	7,267,437	7,753	414,682	100,951	223,236
1929								
Nova Scotia.....	76,742	98,357	175,981	199,384	132	2,515	11,851	75,066
New Brunswick.....	5,142	91,610	20,710	33,360			1,500	80,000
Quebec.....	508,471	1,623,860	2,827,740	3,139,389	13,081	367,074	135,179	157,536
Ontario.....	850,927	926,977	4,380,706	3,759,357			8,039	49,929
Manitoba.....			191,506	885,826	603	9,191		
Alberta.....			4,975	12,046			208	12,500
British Columbia.....	286,883	340,011	119,222	143,319	196	5,282	2,630	23,043
Canada.....	1,728,165	3,080,815	7,720,840	8,172,681	14,012	414,062	159,407	398,971

Table 365.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1928

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	9,409	107,042	207,310	248,312	480	19,642	6,887	48,878
Dressed.....	11,865	667,050	91,886	702,081	1,870	340,585	1,213	18,000
Monumental and ornamental—								
Rough.....	8,933	127,652	3,000	30,000	800	21,700		
Dressed.....	2,486	125,744	225	2,237	150	9,700		
Flagstone.....			305	418			1,631	14,724
Curbstone.....	21,537	121,097						
Paving blocks.....	28,093	184,961						
Limestone, for flux.....			256,913	216,532				
Stone for sugar factories, chemical works, etc.....			257,825	265,212	1,899	2,763		
Poultry grit.....	3	60	184	1,179	100	655		
Ground limestone for agricultural use.....			24,962	81,273				
Rubble and riprap.....	173,123	163,294	414,470	406,863			32,618	43,185
Crushed stone.....	940,361	870,046	5,692,340	5,313,330	2,454	19,637	58,602	98,449
Total.....	1,195,810	2,366,946	6,949,420	7,267,437	7,753	414,682	100,951	223,236

Table 366.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1929

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		\$		\$		\$		\$
Building—								
Rough.....	15,082	137,353	93,766	432,959	914	22,927	12,965	118,678
Dressed.....	23,869	746,537	36,037	944,491	1,908	347,256	1,708	92,500
Monumental and ornamental—								
Rough.....	9,272	121,053	126	955	231	5,732		
Dressed.....	3,153	149,810	699	4,722				
Flagstone.....			129	264			1,630	17,391
Curbstone.....	35,745	226,372	39	393				
Paving blocks.....	18,009	159,327						
Limestone, for flux.....			453,597	376,799				
Stone for sugar factories, chemical works, etc.....			311,686	339,739	7,350	10,658		
Poultry grit.....	2	10	3,054	12,512				
Ground limestone for agricultural use.....			28,744	71,833				
Rubble and riprap.....	231,038	204,287	677,837	561,385			38,198	45,732
Crushed stone.....	1,391,995	1,336,066	6,115,126	5,396,629	3,609	27,489	104,906	124,673
Total.....	1,728,165	3,060,815	7,720,840	8,172,681	14,012	414,062	159,407	398,974

Table 367.—Production in Canada, by Kinds and by Provinces, Imports and Exports of Stone, 1927-1929

	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
PRODUCTION, BY KINDS—		\$		\$		\$
Granite.....	730,049	1,883,557	1,195,810	2,366,946	1,728,165	3,080,815
Limestone.....	6,438,379	7,145,917	6,949,420	7,267,437	7,720,840	8,172,681
Marble.....	5,209	503,037	7,753	414,682	14,012	414,062
Sandstone.....	132,799	232,793	100,951	223,236	159,407	398,974
Total.....	7,306,436	9,265,304	8,253,934	10,272,361	9,622,424	12,066,532
PRODUCTION, BY PROVINCES—						
Nova Scotia.....	72,451	120,807	121,168	213,775	264,706	376,222
New Brunswick.....	29,908	121,091	46,332	142,981	27,352	204,970
Quebec.....	2,534,531	4,268,315	2,992,192	4,849,200	3,484,471	5,317,859
Ontario.....	4,254,960	4,060,709	4,581,929	4,041,568	5,239,672	4,736,263
Manitoba.....	154,666	318,556	235,864	608,217	132,109	895,017
Alberta.....	3,367	7,830	5,010	24,740	5,183	24,546
British Columbia.....	256,553	367,996	271,439	391,820	408,931	511,555
Canada.....	7,306,436	9,265,304	8,253,934	10,272,361	9,622,424	12,066,532
IMPORTS—						
Building stone, other than marble or granite, sawn on more than two sides, but not sawn on more than four sides.....	500	6,793	806	4,085	471	6,285
Building stone other than marble or granite, planed, turned, cut or further manufactured than sawn on four sides.....	190	14,333	239	27,781	1,826	77,685
Flagstone, granite, rough sandstone, and all building stone, not hammered, sawn or chiselled.....		183,777		214,977		307,013
Flagstone and building stone, other than marble or granite, sawn on not more than two sides.....		101,006		213,448		233,084
Granite, rough, not hammered or chiselled		5,250		7,637		65,036
Granite, sawn only.....		188,364		63,932		22,799
Granite, manufactures of, n.o.p.....				129,466		44,857
Granite monuments*.....				10,919		137,359
Paving blocks.....		92,077		137,120		237,680
Marble, rough, not hammered or chiselled		151,288		170,074		267,497
Marble, sawn or sand rubbed, not polished		103,603		126,729		187,717
Marble, manufactures of, n.o.p.....		213,609	597,134	373,453	645,768	405,077
Refuse stone.....	352,467	50,000		70,826		76,364
Manufactures of stone, n.o.p.....						
Total.....		1,110,100		1,550,447		2,068,453
EXPORTS—						
Crushed stone.....	46,772	66,820	128,379	209,852	116,950	200,000
Granite and marble, unwrought.....	3,314	33,289	2,529	26,034	2,467	23,189
Freestone, limestone, and other building stone, unwrought.....	712	7,437	383	3,664	661	8,867
Dressed stone.....		33,760		10,665		5,065
Total.....		141,306		250,215		237,121

*From April 1, 1928.

Table 368.—Capital Employed in the Stone Quarrying Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	\$	\$	\$	\$	\$	\$	\$	\$
Nova Scotia.....	1,103,499	19,257	5,192	1,127,948	1,102,598	23,130	10,336	1,136,064
New Brunswick...	138,811	22,727	36,341	197,879	86,100	21,596	22,807	130,503
Quebec.....	3,923,816	606,103	975,481	5,505,400	4,783,119	470,271	986,142	6,239,532
Ontario.....	6,866,465	403,907	654,433	7,924,805	9,792,035	519,874	687,879	10,999,788
Manitoba.....	373,531	78,315	88,577	540,423	714,796	143,882	217,857	1,076,535
Alberta.....	4,000			4,000	4,000			4,000
British Columbia..	628,879	48,667	49,546	727,092	839,227	85,341	78,768	1,003,336
Canada.....	13,039,001	1,178,976	1,809,570	16,027,547	17,321,875	1,264,094	2,003,789	20,589,758

Table 369.—Employees, Salaries and Wages in the Stone Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and Wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				\$	\$	\$
1928						
Nova Scotia.....	6	86	92	9,195	79,217	88,412
New Brunswick.....	11	89	100	24,568	77,479	102,047
Quebec.....	126	2,690	2,816	241,480	2,215,272	2,456,752
Ontario.....	89	1,581	1,670	190,223	1,356,414	1,546,637
Manitoba.....	14	257	271	35,863	359,853	395,716
British Columbia.....	12	9	21	26,305	7,500	33,805
Canada.....	258	4,871	5,129	527,634	4,278,880	4,806,514
1929						
Nova Scotia.....	7	163	170	12,454	154,621	167,075
New Brunswick.....	9	123	132	20,264	98,494	118,758
Quebec.....	158	2,892	3,050	238,792	2,452,577	2,691,369
Ontario.....	108	1,609	1,717	233,479	1,512,882	1,746,361
Manitoba.....	20	375	395	52,120	376,114	428,234
Alberta.....	14	7	21	30,002	10,147	40,149
British Columbia.....	14	196	210	30,002	267,815	297,817
Canada.....	316	5,365	5,681	587,111	4,872,650	5,459,761

*See note page 37.

Table 370.—Wage-Earners in the Stone Industry in Canada, by Months and by Provinces, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January.....	120	48	1,130	652	124	8	138	2,220
February.....	147	56	1,168	638	107	8	96	2,220
March.....	118	90	1,185	982	180	10	171	2,736
April.....	136	110	1,606	1,382	315	12	180	3,741
May.....	158	125	2,266	1,833	343	12	188	4,925
June.....	165	153	2,673	1,897	516	11	186	5,601
July.....	231	156	2,887	2,012	513	6	194	5,999
August.....	237	153	3,032	1,969	530	6	212	6,139
September.....	193	148	2,914	1,667	555	4	208	5,689
October.....	158	154	2,750	1,413	547	4	208	5,234
November.....	136	141	2,434	967	414	4	206	4,302
December.....	94	112	1,682	645	204	2	185	2,924

Table 372.—Products of the Monumental and Ornamental Stone Industry
in Canada, 1928 and 1929

CHAPTER X

DIRECTORY

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given and the location of the properties worked in 1929 is also shown.

METAL MINING INDUSTRIES

Alluvial Gold Mining Industry

Name	Address	Location
QUEBEC		
Mill Creek Gold Mines.....	Beauceville.....	Beauceville.
BRITISH COLUMBIA		
Adams, Geo.....	Atlin.....	McKee Creek.
Big Bend Platinum & Gold Co.....	Tulameen.....	Tulameen River.
Bride, Maurice.....	Atlin.....	Lyn Creek.
Brown, F. and Highland, V.....	Atlin.....	Wright Creek.
Cassiar Hydraulic Mines, Ltd.....	Wrangel, Alaska.....	Cassiar District.
Cariboo Eagle Mine.....	Cottonwood.....	Cariboo District.
Campbell, Robert.....	Grand Forks.....	McRae Creek.
Cayosh Falls Mining Co.....	1305 Burnaby St., Vancouver.....	Lillooet Mining Div.
Cavanagh & Stevens.....	Rosswood.....	
Carwford, Frank.....	Porter Landing.....	Cassiar District.
Carinelle Placers Ltd.....	602 Stock Exchange Bldg., Vancouver.	
Compagnie Française des Mines.....	Atlin.....	Atlin Mining Div.
Daly & Johnston.....	Big Bar Creek.....	Clinton Mining Div.
Dang Sang.....	Barkerville.....	Slough Creek.
Dease Creek Mines Corp.....	401 Mutual Life Bldg., Seattle, Wash., U.S.A.	Dease Creek.
Drayton, W. A.....	Fort Steele.....	Fort Steele Mining Div.
Duplex Placer Mining Co.....	3467 Pt. Grey Rd., Vancouver.....	Wreck Bay, Vancouver Island.
East Kootenay Ruby Co., Ltd.....	Natal.....	Ruby Creek.
Falek, Emil M.....	Cottonwood.....	Anderson Creek.
Falconer, D. K.....	Discovery.....	Spruce Creek.
Forty Nine Creek Placers, Ltd.....	414 Ward St., Nelson.....	Forty Nine Creek.
French Creek Development Co.....	502 Howe St., Vancouver.....	Revelstoke.
Guest Placer Mining Camp.....	456 Seymour St., Vancouver.....	Coalmont.
Hartman, C. W.....	Princeton.....	Similkameen.
Hobson Creek Mining Co.....	210 Northwest Bldg., Vancouver.....	Kamloops Mining Division.
Kemp, H. and Laekie, C.....	206 Mercantile Bldg., Vancouver.....	Cariboo District.
Keller, E.....	Lumberton.....	Ft. Steel Min. Div.
Lowhee Mining Co.....	1109 Rust Bldg., Tacoma, Wash., U.S.A.	Cariboo Dist.
McConkell, R. S.....	Fort St. James.....	Germansen Creek.
Moses, Wm.....	Coalmont.....	Tulameen river.
Morse, H. O. and McKechnie, Wm.....	Atlin.....	Last Chance Creek.
Mosquito Hydraulic Association.....	727-23rd Ave. S., Seattle, Wash., U.S.A.	Nosquita Creek.
Murphy, Nathan.....	Atlin.....	O'Donnell River.
Omineca Gold Dredging Co.....	715 Lloyd Bldg., Vancouver.....	Manson Creek.
Pierre River Syndicate.....	410 Rogers Bldg., Vancouver.....	Yale Mining Div.
Paymore Mines, Ltd.....	Louis Creek.....	Kamloops Min. Div.
Prpiet, Thomas.....	Atlin.....	Last Chance Creek.
Pini Marco & Co.....	Atlin.....	Spruce Creek.
Point Hydraulic Mining Co.....	Barkerville.....	Slough Creek.
Price, Burroughs & Scott.....	Beaver Mouth.....	
Roddick, J. P.....	Barkerville.....	Barkerville Area.
Shade, W. C.....	Cottonwood.....	Cariboo District.
Stevens, Joel.....	Barkerville.....	Williams Creek.
Sutherland & Anderson.....	Likely.....	Spanish Creek.
Sotheran, Garnet.....	Tulameen.....	Similkameen Min. Div.
Sundberg, M.....	Cottonwood.....	Donovan Creek.
Tong Sing Tong.....	Barkerville.....	Slough Creek.
Tong Lee.....	Hazleton.....	Vital Creek.
Tregillus, F. and House, J. S.....	Barkerville.....	Cunningham Creek.
Turnquist, Emil.....	Atlin.....	Ruby Creek.
Wing & Benjamin.....	Telegraph Creek.....	Quartz Creek.
Wendle, Jas.....	Barkerville.....	Cariboo District.
Williams, Jas. F.....	Cariboo.....	Last Chance Creek.
Yeager, A. C.....	Lumberton.....	Fort Steel Mining Div.
YUKON		
Yukon Cons. Gold Corp.....	Central Chambers, Ottawa, Ont....	Yukon.

Auriferous Quartz Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
Acadia Gold Mines, Ltd.	Enfield	Acadia	Oldham.
Novomac Mines and Power Corporation (formerly Consolidated Mines and Power Corp.)	Halifax, Box 216	Goldenville	Goldenville.
*Pleasant River Gold Mines Ltd.	Box 348, Kentville	Pleasant River	Lunenburg Co.
Victory Gold Mines Ltd.	Goldboro	Victory	Stormont.
QUEBEC			
Arntfield Gold Mines Ltd.	159 Bay St., Toronto	Arntfield	Boischatel Tp.
*Graham Bousquet Mining Corporation.	603 Royal Bank Building, Toronto, Ont.	Graham Bousquet	Bousquet Tp.
*Malartic Gold Mines Ltd.	530 Excelsior Life Bldg., Tor- onto, Ont.	Malartic	Fournier Tp.
O'Brien and Fowler Ltd.	816 Ottawa Electric Bldg., Ottawa, Ont.		Cadillac Tp.
*Siscoe Gold Mines Ltd.	276 St. James St., Montreal	Siscoe	Dubuisson Tp.
*Thompson Cadillac Mining Co., Ltd.	200 Bay St., Toronto, Ont.		Cadillac Tp.
ONTARIO			
<i>Afton Townships—</i>			
*Afton Mines, Ltd.	Box 1933, Sudbury	Golden Rose	Afton Tp.
<i>Boston Creek Area—</i>			
Barry-Hollinger Gold Mines, Ltd.	807. General Assurance Bldg., Toronto.	Barry-Hollinger	Pacaud Tp.
*Boston McCrea Gold Mines Ltd.	510 Kent Bldg., Toronto	Boston McCrea	Pacaud Tp.
*Telluride Gold Mines Ltd.	Northern Ontario Bldg., Tor- onto.	Telluride	Skead Tp.
<i>Frontenac Area—</i>			
*Ore Chimney Mining Co.	Northbrook	Ore Chimney	Barrie Tp.
<i>Kenora Area—</i>			
*Kenora Prospectors and Miners, Ltd.	Kenora	Mikado	Shoal Lake.
<i>Kirkland Lake Area—</i>			
*Benoit Gold Mines Ltd.	Sun Life Bldg., Hamilton, Ont.	Benoit	Benoit Tp.
*Bidgood Consolidated Mines, Ltd.	171 Yonge St., Toronto	Bidgood	Lebel Tp.
*Continental Kirkland Mines, Ltd.	Box 752 Kirkland Lake	Continental Kirkland	Lebel Tp.
*Federal Kirkland Mining Co., Ltd.	208 Northern Ontario Bldg., Toronto.	Federal Kirkland	Teck and Lebel Tps.
Kirkland Lake Gold Mining Co., Ltd.	810 Lumsden Bldg., Toronto.	Kirkland Lake	Teck Tp.
Lake Shore Mines Ltd.	Kirkland Lake	Lake Shore	Teck Tp.
*Scott Kirkland Gold Mines	Arnprior	Scott-Kirkland	Teck Tp.
Sylvanite Gold Mines Ltd.	Kirkland Lake	Sylvanite	Teck Tp.
Teck-Hughes Gold Mines Ltd.	Kirkland Lake	Teck-Hughes	Teck Tp.
*Tough Oakes, Burnside Gold Mines	Kirkland Lake	Tough Oakes	Teck and Lebel Tps.
*Trout Creek Gold Mining Co., Ltd.	Bank of Commerce Bldg., St. Catharines.	Trout Creek Gold Mine	Teck Tp.
Wright-Hargreaves Mines Ltd.	Bridgeburg	Wright-Hargreaves	Teck Tp.
<i>Larder Lake Area—</i>			
*East Main Gold Mines Ltd.	Argonaut	East Main	Gauthier Tp.
*Kirkland Gold Belt Mines.	Kent Bldg., Toronto	Gold Belt	Lebel Tp.
*Murphy Mines Ltd.	208 Northern Ontario Bldg., Toronto.	Murphy	Gauthier Tp.
*Northland Gold Mines Ltd.	Northland Mines	Northland Gold	Gauthier Tp.
*Ritchie Gold Mines Ltd.	11 King St. W., Toronto	Ritchie Gold	Gauthier Tp.
*Walsh-Katrine Gold Mines, Ltd.	1006-1410 Stanley St., Mont- real, P.Q.	Walsh-Katrine	Katrine Tp.
<i>Lightning River Area—</i>			
*Harker Gold Mines Ltd.	Concourse Bldg, Toronto	Harker	Harker Tp.
<i>Michipicoten Area—</i>			
Cooper Gold Mines, Ltd.	Star Bldg., Toronto	Cooper	Algoma Dist.
*Towagmact Exploration Co., Ltd.	921 New Birks Bldg., Mont- real, P.Q.	Michael-Boyle Option	Goudreau.
<i>Mongowin Tp.—</i>			
*McMillan Gold Mines, Ltd.	52 Elm St., Sudbury	House Lake	Mongowin.
<i>Northwestern Ontario Area—</i>			
*Bonanza United Mines, Ltd.	806 Royal Bank Bldg., Toronto	Bonanza, Rognon, Redeemer.	Van Horne.
*British Canadian Mines Ltd.	8 Bloor St. E., Toronto	Foley	Rainy River Tp.
Gold Rock Mining Syndicate.	Electric Bldg., Ottawa	Gold Rock	Manitou Lake.
*Moss Mines Ltd.	132 St. James St., Montreal	Huronian	Kashabowie.
Northern Red Lake Mines Ltd.	Mine Centre	Golden Star	Rainy River.
Wabigoon Contact Gold Mines Ltd.	615 W. 150th. St., New York, N.Y.	Wabigoon-Contact	Dryden.
<i>Patricia Area—</i>			
Bathurst Mines, Ltd.	51 Sparks St., Ottawa	Bathurst	Skinner Tp.
Bobjo Mines, Ltd.	372 Bay St., Toronto	Bobjo	Bobjo Manion, P.O.
*Howey Gold Mines, Ltd.	Concourse Bldg., Toronto	Howey	Red Lake.
<i>Porcupine Area—</i>			
Ankerite Gold Mines, Ltd.	Box 535, South Porcupine	Ankerite	Deloro Tp.
*Canusa Mining and Exploration Co., Ltd.	Metropolitan Bldg., Toronto	Canusa	Whitney Tp.
Coniaurum Mines, Ltd.	Schumacher	Coniaurum	Tisdale Tp.
Dome Mines, Ltd.	36 Toronto St., Toronto	Dome	Tisdale Tp.

Auriferous Quartz Mining Industry—Concluded

Name	Address	Name of Mine	Location
ONTARIO—Concluded			
Hollinger Consolidated Gold Mines, Ltd.	Timmins.....	Hollinger.....	Tisdale Tp.
March Gold Ltd.	Box 533, South Porcupine.....	March Gold.....	Deloro Tp.
McIntyre Porcupine Mines, Ltd.	Schumacher.....	McIntyre, Porcupine.....	Schumacher.
Porcupine United Ltd.	Timmins.....	Porcupine-United.....	Deloro Tp.
*Polaris Gold Mines of Canada, Ltd.	Box 1691 Timmins.....	Polaris.....	Mount Joy Tp.
Vipond Consolidated Mines, Ltd.	Star Bldg., Toronto.....	Vipond.....	Tisdale Tp.
West Dome Lake Gold Mines, Ltd.	New Liskeard.....	West Dome.....	Tisdale Tp.
Sudbury* Area—			
*Mundell, Wm. A.	Metagama.....	Ina.....	Sudbury Dist.
Temiskaming District—			
*Gold Hill Mines, Ltd.	Haileybury.....	Gold Hill.....	Catharine Tp.
Thunder Bay Area—			
St. Anthony Gold Mines Ltd.	25 Melinda St., Toronto.....	St. Anthony.....	Sturgeon Lake.
*Tashota Gold Mines Ltd.	Tashota.....	Tashota.....	Kowkash Division.
West Shining Tree Area—			
*Davidson-Carr	Imperial Bldg., Hamilton.....	Davidson-Carr.....	Sturgeon Lake.
*The Buckingham Mines, Ltd.	116 Federal Bldg., Toronto.....	Buckingham.....	Asquith and McMurchy Tps.
MANITOBA			
Central Manitoba Mines, Ltd.	301 Mining Exchange Bldg., Winnipeg.	Central Manitoba.....	Long Lake Dist.
*Eldorado Gold Mines, Ltd.	319 Bay St., Toronto, Ont.	Eldorado.....	Long Lake Dist.
*San Antonio Mines Ltd.	Bissett, Man.	San Antonio.....	Rice Lake.
BRITISH COLUMBIA			
*B.C. Silver Mines, Ltd.	612 Pacific Bldg., Vancouver.	B.C. Silver.....	Portland Canal.
*Columario Gold Mines, Ltd.	357 Bay St., Toronto, Ont.	Valhalla-Kleanza.....	Omineca Mining District
Hedley Gold Mining Co., Ltd.	Hadley.....	Nickel Plate.....	Osoyoos Mining Div.
Hope Gold Mines Ltd.	744 Hastings St., Vancouver.	Hope.....	Yale Div.
*Marmot River Gold Mines, Ltd.	313 Crown Bldg., Vancouver.	Marmot River Gold.....	Portland Canal District.
McCarthy, J. F.	Grand Forks.....	Union.....	Kettle Valley.
Midnight Mining Co.	Rossland.....	Midnight.....	Rossland.
Pioneer Gold Mines of B.C., Ltd.	Pioneer Mine.....	Pioneer.....	Lilloet Dist.
*Pre Cambrian Gold Mines.	1827 L.C. Smith Bldg., Seattle Wash., U.S.A.	Pre Cambrian Gold.....	Yale Mining Division.
Premier Gold Mining Co., Ltd.	London Bldg., Vancouver.....	Premier.....	Cassiar Dist.
Relief Arlington Mines Ltd.	Erle, B.C.	Second Relief.....	Nelson Mining Division.
Reno Gold Mines, Ltd.	Salmo.....	Reno.....	Sheep Creek.
*Paul H. Schulz (Hecla Mining Co.)	Grand Forks.....	Union Mine.....	Kettle Valley Dist.
Thurlow Gold Mines Ltd.	207 Hastings St., Vancouver.	Thurlow.....	Thurlow Island.
Waterloo Consolidated Mines Ltd.	Penticton.....	Waterloo.....	Kettle River Dist.

Copper-Gold-Silver Mining Industry

Name	Address	Name of Mine	Location
QUEBEC			
Abana Mines, Limited.....	134 King St. East, Toronto, Ont.	Abana.....	Desmeloizes Tp.
*Abbey Mines, Limited.....	132 St. James St., Montreal...	Abbey.....	Desmeloizes Tp.
*Aldermac Mines, Limited.....	921 New Birks Building, Montreal.	Aldermac.....	Boischatel Tp.
*Amulet Mines, Limited.....	Room F16 Transportation Building, 132 St. James St., Montreal.	Amulet.....	Rouyn Tp.
*Area Mines, Limited.....	132 St. James St., Montreal...	Area.....	Duprat-Dufresnoy-Rouyn Tps.
*Arutfield Gold Mines, Limited.....	302 Old Birks Building, Montreal.	Arutfield.....	Boischatel Tp.
*Arrowhead Consolidated Mines, Limited.	412, New Birks Building, Montreal.		Jeannes Tp.
*Bay Consolidated Mines, Limited.....	P.O. Box 111, Station B, Montreal.		Rouyn Tp.
*Bellehumeur Mining Company, Limited	38 King St. West, Toronto, Ont.		Laverlochère Tp.
*Boischatel Mines, Limited.....	310 Blackburn Bldg., Ottawa, Ont.		Rouyn Tp.
*Brown Bousquet Mines, Limited.....	Keefe Bldg., Montreal.....		Bousquet Tp.
*Burlingame Mines, Limited.....	603 Royal Bank Bldg., Toronto 2, Ont.		Boischatel, Duprat and Rouyn Tps.
*Cadillac Mining and Development Syndicate, Limited.	Box 842, Rouyn.....		Duprat Tp.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
<i>QUEBEC—Continued</i>			
*Colbee Copper Nickel Syndicate, Limited.	26 Fraser Building, Ottawa, Ont.		Pontiac County.
*Canada Québec Mining Corporation, Limited.	132 St. James St., Montreal.		Desmeloizes and Four-nière Tps.
*Canadian American Copper Refining Company, Limited.	207 Notre Dame St., W., Montreal.		Eastman.
*Canadian Exploration, Limited.	126 rue St. Pierre, Quebec.		
*Canadian Rouyn Syndicate.	709 Stuart Ave., Montreal.		Rouyn Tp.
*Cannon, Francis Edward.	c/o M. A. Wilson, 311 Temple Bldg., Toronto, Ont.		Dufresnoy Tp.
*Capital Rouyn Gold Mines, Limited.	374 1st Ave., Ottawa, Ont.		Rouyn, Boischatel and Duprat Tps.—Hasse and Hasty Tps., Ont.
*Champlain Rouyn Mines, Limited.	Room 404, 266 St. James St. W., Montreal.		Destor Tp.
*Chibougamau McKenzie Mines, Limited.	336 Board of Trade Building, Montreal.		Chibougamau and Obal-ski Tps.
*Chibougamau Prospectors Limited.	824 Royal Bank Bldg., Montreal.		Merritt Island and Cedar Bay.
*Clericy Consolidated Mines, Limited.	74 Sparks St., Ottawa, Ont.		Clericy Tp.
*Colin's Mining Corporation, Limited.	750 rue St. Gabriel, Montreal.		Destor Tp.
*Consolidated Copper and Sulphur Company, Limited.	Eustis.		Ascot Tp.
Consolidated Mining & Smelting Company of Canada, Limited.	706 Drummond Bldg., Montreal.		Duprat Tp.
*Copper Basin Gold Mines, Ltd.	Room 611-159 Craig St. W., Montreal.		Dubuisson Tp.
*Copper Creek Exploration Syndicate.	Cheminis, Ontario.		Dasserat & Dufay Tps.
*Corona Mines, Ltd.	126 St. Peter St., Quebec.		Rouyn Tp., Que., and Kamiskolia Dist., Ont.
*Demara Mines, Ltd.	Room 116, 276 St. James St., Montreal.		Desmeloizes and Four-nière Tps. and Abitibi Dist., Que.; Cold Lake Section, Manitoba.
*Don Rouyn Gold Mines, Ltd.	Can. Pac. Express Bldg., Montreal.		Rouyn, Dufresnoy and Malartic Tps.
*Dunlop Consolidated Mines, Ltd.	1511-67 Yonge St., Toronto, Ont.		Mattagami Lake, Que.
*Duparquet Mining Co., Ltd.	204 Hospital St., Montreal.		Duparquet & Destor Tps.
*Duprat Mines, Ltd.	126 St. Peter St., Quebec.		Duprat and Montbray Tps., Que., and Kamiskotia Dist., Ont.
*Explorer Syndicate.	c/o W. M. Goodwin, P.O. Box 141, Ste. Anne de Bellevue.		Rouyn Tp.
*Fosbury Mines, Ltd.	824 Royal Bank Bldg., Montreal.		Chibougamau and Lac Doré, Que.
*Gilbey Mines, Ltd.	200 Bay St., Toronto, Ont.		Dufresnoy Tp.
*Granada Rouyn Mining Co., Ltd.	Rouyn.	Granada.	Rouyn Tp.
*Greene Stabell Mines, Ltd.	1406 Concourse Bldg., Toronto, Ont.	Greene Stabell.	Dubuisson Tp.
*Kinojevis Mining Co., Ltd.	Temiskaming.		Rouyn Tp.
*Kitchener Rouyn Mines, Ltd.			Clericy Tp.
*Knox Wiltsay Syndicate.	New Liskeard.		Rouyn Tp.
*La Mine d'Or Vénus, Limitée.	104 rue St. Jean, Québec.	La Mine d'Or Vénus.	Barraute Tp.
*La Reine Mine, Limitée.	Amos.		
*Laval-Quebec Mines, Ltd.	215 St. James St. W., Montreal.		La Reine and Rouyn Tps.
*Lavoie-Gill Mining Corporation.	801 Lacordaire St., Montreal.	Lavoie-Gill.	Destor Tp.
*Lemire Gold & Copper Mines, Ltd.	74 Sparks St., Ottawa, Ont.	Lemire.	Hebecourt Tp.
*LeRoy Mines, Ltd.	35 Notre Dame St. W., Montreal.		Fiedmont, Senneterre, Castagnier and McKenzie Tps.
*Les Mines Lac Dufault, Ltée.	4350 rue St. Denis, Montréal.		Arquebelle, Dufresnoy, Dasserat, Desmeloizes and Dupuy Tps.
*Locarno Copper Mines, Ltd.	139 Sparks St., Ottawa, Ont.		Dufresnoy, Cadillac and Bousquet Tps.
*Mabell Mines, Ltd.	410 New Birks Bldg., Montreal.	Mabell.	Clericy Tp.
*Marillac Mining Syndicate, Ltd.	410 Blackburn Bldg., Ottawa, Ont.	Marillac.	Joannes Tp.
*Mines Development Corp.	104 Rue St. Jean, Québec.		Barraute Tp.
*Normac Development Co., Ltd.	Blackburn Bldg., Ottawa, Ont.		Malartic Tp.
*Natanag Gold Mines, Ltd.	115½ avenue Cartier, Québec.	Natanag.	Barraute Tp.
*National Base Metals Corp.	75 Sparks St., Ottawa.	Arno.	Desmeloizes Tp.
*Navarre Mines, Ltd.	Concourse Bldg., Toronto.	Navarre.	Dufresnoy Tp.
*Newbec Mines, Ltd.	Noranda.	Newbec.	Rouyn Tp.
*Nickel and Copper Bar Syndicate.	Roberval.		Labarre Tp.
*Noranda Mines, Ltd.	Royal Bank Bldg., Toronto.	Horne.	Rouyn Tp.
*Normac Mining Syndicate.	Concourse Bldg., Toronto.		Boischatel Tp.
*Norman Mines.	Blackburn Bldg., Ottawa.		Dalquier Tp.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—Concluded			
*Nova Mines, Ltd.	35 Notre Dame W., Montreal.		Duparquet Tp.
*Obalski-Chibougamau Mining Co.	25 St. James St. E., Montreal.		Obalski Tp.
*Obasko Mines, Ltd.	Kirkland Lake.		Louvicoourt Tp.
*O'Leary-Malartic Mines, Ltd.	Rouyn—Box 249.		DuParquet Tp.
*Oriole Mines, Ltd.	Continental Life Bldg., Toronto.	Oriole.	Montbray Tp.
*Osisko Lake Mines, Ltd.	100 Adelaide St. W., Toronto.		Rouyn Tp.
*Powell Mining Properties, Ltd.	Confederation Life Bldg., Toronto.	Powell.	Rouyn Tp.
*Precambrian Holdings, Ltd.	Keefer Bldgs, Montreal.		Cadillac Tp.
*Quebec Chibougamau Mines, Ltd.	500 Place d'Armes, Montreal.		Obalski Tp.
*Quebec Copper Corp., Ltd.	Noranda.		Duprat Tp.
*Quemont Mining Corp., Ltd.	350 Bay St., Toronto.	Quemont.	Rouyn Tp.
*The Ranger-Cadillac Mines, Ltd.	Amos.		Cadillac Tp.
*Read Authier Mine, Ltd.	Amos.		Bourlamaque Tp.
*Renault Mining Co., Ltd.	10 St. James St. W., Montreal.	Renault.	Dasserat Tp.
*Renown Mining Co., Ltd.	Jackson Bldg., Ottawa.	Renown.	Boischatel Tp.
*Rhyolite Rouyn Mines, Ltd.	Royal Bank Bldg., Toronto.		Duprat Tp.
*Rouyn Chibougamau Mining Co.	105 Mountain Hill, Quebec.		Rouyn Tp.
*Rouyn Prospects, Ltd.	77 King St. W., Brockville, Ont.		Duprat Tp.
*Rouyn Western Mines, Ltd.	Turner Bldg., Hamilton.	Rouyn-Western.	Duprat Tp.
*Rubec Mines, Ltd.	276 St. James St., Montreal.	Rubec.	Rouyn Dist.
*Sladen-Malartic Mines, Ltd.	48 Sparks St., Ottawa.		Malartic Tp.
*S. S. Copper Mine, Ltd.	70 Wellington St., Sherbrooke.		South Stukely
*Stadacona Rouyn Mines, Ltd.	132 St. James St., Montreal.		Rouyn Dist.
*Star Gold Mines, Ltd.	142 Notre-Dame, Trois-Rivières.		Clericy Tp.
*Sullivan Gold Mines, Ltd.	159 Craig St. W., Montreal.	Sullivan.	Dubuisson Tp.
*Suzor Mining Syndicate.	Parent, Que.		Suzor Tp.
*Syndicate Amulet-Montgomery.	4350 St. Denis St., Montreal.		Dasserat Tp.
*Thompson Malartic Mines, Ltd.	200 Bay St., Toronto.		Cadillac Tp.
*Toronto Rouyn Syndicate.	Box 103, Rouyn.		Rouyn Tp.
*Towagamac Exploration Co., Ltd.	New Birks Bldg., Montreal.		Gaspé.
*Valco Mines Co., Ltd.	3 rue Sault au Matelot, Quebec.		Cadillac Tp.
*Waite-Ackerman-Montgomery Mines, Ltd.	Noranda.	Waite-Montgomery.	Duprat Tp.
*Wasamac Mines, Ltd.	4350 St. Denis St., Montreal.		Dasserat Tp.
*Wendt-Wheard Mines, Ltd.	1008 Keefer Bldg., Montreal.		Launay Tp.
*Wietsey-Coglan Mines, Ltd.	Box 125, Noranda.		Rouyn Tp.
*Windfall Rouyn Mines, Ltd.	New Birks Bldg., Montreal.	Kenejevis.	Rouyn, Tp.
*Windsor Mines, Ltd.	105 Mountain Hill, Quebec.	Windsor.	La Sarre Tp.
*Wood Cadillac Mines, Ltd.	Keefer Bldg., Montreal.		Cadillac Tp.
ONTARIO			
Amity Copper and Gold Mines, Ltd.	Boston Creek.	Amity.	Boston Creek.
Patterson Copper Mines, Ltd.	Northern Ontario Bldg., Toronto.	Patterson.	Boston Creek.
Shield Development Co., Ltd.	815 Transportation Bldg., Montreal.	Tip Top.	Kashabowie.
*Seymour Copper Mines, Ltd.	Rouyn.	Seymour.	Salter Tp.
*Sudbury Basin Mines, Ltd.	100 Adelaide St. W., Toronto.	Sudbury Basin.	Sudbury.
*Trettheway-Ossian Mines, Ltd.	12 King St. E., Toronto.	Trettheway-Ossian.	Boston Creek.
*White Lake Mines, Ltd.	302 Royal Bank Bldg., Toronto.		White Lake.
MANITOBA			
*Flin Flon Mines, Ltd.	14 Wall St., New York.	Flin Flon.	The Pas Dist.
*Mandy Mines, Ltd.	Bullitt Bldg., Philadelphia.	Mandy.	The Pas Dist.
*Manitoba Basin Mining Co., Ltd.	200 Bay St., Toronto.		Herb Lake.
*Sherritt Gordon Mines, Ltd.	100 Adelaide St. W., Toronto.	Sherritt-Gordon.	The Pas Dist.
BRITISH COLUMBIA			
Armstrong, R. V.	Copper Mountain.	Shamrock.	Summers Creek.
Aurimont Mines, Ltd.	850 Hastings St. W., Vancouver.		New Hazelton.
Bayonne Gold Mines, Ltd.	Salmo.	Bayonne.	Nelson Dist.
Britannia Mining and Smelting Co., Ltd.	Britannia Beach.	Britannia.	Vancouver County.
Cambria Copper Co., Ltd.	402 West Pender St., Vancouver.	Cambria.	Knight-Inlet.
*Central Copper and Gold Co., Ltd.	Standard Bank Bldg., Vancouver.		Texada Island.
*Coalmont Gold Mines, Ltd.	470 Granville St., Vancouver.	Coalmont.	Granite Creek.
*Coast Copper Co., Ltd.	Trail.	Old Sport.	Quatsino Mining Div.
*Consolidated Mining & Smelting Co., Ltd.	Trail.	Avax.	Kamloops Mining Div.

Copper-Gold-Silver Mining Industry—Concluded

Name	Address	Name of Mine	Location
<i>QUEBEC—Concluded</i>			
*Consolidated Mining and Smelting Co., Ltd.	Trail.....	Iva Fern.....	Nelson Mining Div.
*Consolidated Mining and Smelting Co., Limited.	Trail.....	Caledonia.....	Quatsino M. D.
*Consolidated Mining and Smelting Co., Limited.	Trail.....	Richmond.....	Omineca M. D.
*Consolidated Mining and Smelting Co., Limited.	Trail.....	A. and T.....	Portland Canal.
*Consolidated Mining and Smelting Co., Limited.	Trail.....		Rossland.
*George Gold Copper Co., Ltd.	Tadanac.....	George.....	Portland Canal.
*George Enterprise Mining Co., Ltd.	211 Pemberton Bldg., Victoria	George Enterprise.....	Portland Canal.
*Golden Age Mining Co., Ltd.	411½ Ward St., Nelson.....	Golden Age.....	Nelson M. D.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Anyox.....	Bonanza.....	Naas River M. D.
Granby Consolidated Mining, Smelting and Power Co., Limited.	Anyox.....	Copper Mountain.....	Allenby.
Granby Consolidated Mining, Smelting and Power Co., Limited.	Anyox.....	Hidden Creek.....	Naas River M. D.
*Keene Mountain Gold & Silver Mines, Ltd.	311 Lancaster Bldg., Calgary.	White Eagle.....	Poplar.
*Lorne Gold Mines, Ltd.	35 Commerce Bldg., Vancouver.	Lorne.....	Lillooet M. D.
Marble Bay Copper Mines, Ltd.	Van Anda.....	Marble Bay.....	Nanaimo M. D.
Meadow Creek Mines.....	Box 112, Kamloops.....	Ford.....	Kamloops M. D.
Mogul Mining Co., Ltd.	509 Union Bldg., Victoria.	Mogul.....	Greenwood M. D.
Mountain Bay Mining Co., Ltd.	112 St. James St., Montreal.	Mountain Bay.....	Cassiar M. D.
*Mount Diadem Mines, Ltd.	151, 8th Ave., E., Vancouver.	Mt. Diadem.....	Jervis Inlet.
*North Kootney Mines, Ltd.	710 Seymour St., Vancouver.	Pretty Girl.....	Windermere M. D.
*Norway Mining Co., Ltd.	Box 294, Trail.....	Norway.....	Trail Creek.
*Pitt Mining Co., Ltd.	511 Randall Bldg., Vancouver.	Pitt.....	Pitt Lake.
*Quatsino Copper-Gold Mines, Ltd.	1208 Vancouver Block, Vancouver.	Quatsino.....	Quatsino Sound.
*Radiant Copper, Ltd.	501 B.C. Mining Bldg., Vancouver.		Squamish.
*Romana Copper Mines, Ltd.	612 Hastings W., Vancouver.	Romana.....	Nanaimo M. D.
*Seven Sisters Mines, Ltd.	Tadanac, Trail.....	Seven Sisters.....	Cedarvale.
*Staples, T. B.	Juneau, Alaska.....	Tulsequal-Chief.....	
*Sunloch Mines, Ltd.	Trail.....	Sunloch.....	Victoria M. D.
*Surf Point Mines.....	3857 Point Grey Road, Vancouver.	Surf Point.....	Porcher Island.

Chrome Mining Industry

Name	Address	Name of Mine	Location
Consolidated Mining and Smelting Co., Ltd.	Trail, B.C.....	Flint and Baer.....	Ashcroft, B.C.

Iron Mining Industry

QUEBEC			
Baie St. Paul Titanic Iron Ore Co.....	Baie St. Paul.....		Baie St. Paul.
*Titanium, Ltd.	20 St. Paul St., Montreal.....		Ivry, Que.

Molybdenum Mining Industry

*Consolidated Mining and Smelting Co., Ltd.	Trail, B.C.....	Molly.....	Nelson M. D.
Molybdenite Reduction Co., Ltd.	24 St. James St. W., Montreal.		La Corne Tp.
*Saguenay Prospecting Corp., Ltd.	33 Sous le Fort, Quebec.....		Bergeronnes Tp.

Nickel-Copper Mining Industry

Name	Address	Name of Mine	Location
*Calbec Copper-Nickel Syndicate.....	Fraser Bldg., Ottawa.....	Calbec.....	Calumet Island.
*Falconbridge Nickel Mines, Ltd.....	100 Adelaide St. W., Toronto..	Falconbridge.....	Sudbury Dist.
International Nickel Co., of Canada, Ltd.	Dominion Bank Bldg., Toronto..	Frood, Levack, Creighton, Garson.	Sudbury Dist.
*McVitte-Graham Mines, Ltd.....	132 St. James St. W., Montreal		Sudbury Dist.
*Mincor, Ltd.....	350 Bay St., Toronto.....		Sudbury Dist.

Quicksilver Mining Industry

*Canadian Quicksilver Company, Ltd....	315 Vancouver Block, Vancouver, B.C.		Vancouver, Island.
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Non-Ferrous Smelting and Refining Industry

Name	Address	Location
QUEBEC		
Aluminum Co. of Canada, Ltd.....	46 King St. W., Toronto, Ont.....	Arvida.
Horne Copper Corporation.....	Rouyn.....	Rouyn.
ONTARIO		
Deloro Smelting and Refining Co., Ltd.....	Deloro.....	Deloro.
Kingdon Mining, Smelting and Manufacturing Co.....	Galetta.....	Galetta.
International Nickel Co., of Canada, Ltd.....	Dominion Bank Bldg., Toronto.....	Copper Cliff.
BRITISH COLUMBIA		
Consolidated Mining and Smelting Co.....	Trail.....	Trail.
Granby Consolidated, Mining, Smelting and Power Co., Ltd.	Anyox.....	Anyox.

Silver-Cobalt Mining Industry

*Blair Gowganda Mines, Ltd.....	Barrie, Ont.....	Kerr Lake.....	Gowganda.
Brocklebank, Arthur.....	Box 929, Cobalt.....	Reaver.....	Coleman Tp.
Cain, C. E.....	Cobalt.....	Castle-Trethewey.....	Coleman Tp.
Castle-Trethewey Mines, Ltd.....	Bestel, Ont.....	Badger.....	Haultain Tp.
Chitty, L.....	Cobalt.....	Coniagas.....	Coleman Tp.
Clemens, E. H.....	Box 687, Cobalt.....	Contact.....	Bucke Tp.
Cobalt Contact Mines, Ltd.....	8 Bloor St. E., Toronto.....	Frontier Lorraine.....	Bucke Tp.
*Cobalt Kittson Mines, Ltd.....	Latchford.....	Kirk Budd.....	Kittson, Tp.
Frontier Lorraine Mines, Ltd.....	350 Bay St., Toronto.....	Keeley.....	South Lorraine Tp.
*Kirk Budd Mining Co.....	221 Arcade Bldg., Utica, N.Y.	Aguanico.....	
Keeley Silver Mines, Ltd.....	Star Bldg., Toronto.....	Keeley.....	South Lorraine.
Jemmet, D. L., Ltd.....	Cobalt.....	Kirk Budd.....	Bucke Tp.
Keeley Silver Mines, Ltd.....	Star Bldg., Toronto.....	La Rose.....	South Lorraine.
*Kirk Budd Mining Co.....	221 Arcade Bldg., Utica, N.Y.	Lorraine Trout Lake.....	Cobalt.
La Rose Mines, Ltd.....	Concourse Bldg., Toronto.....	Crown Reserve.....	Silver Centre.
*Lorraine Trout Lake Mines, Ltd.....	350 Bay St., Toronto.....	Savage.....	Cobalt.
Martin, G.....	Cobalt.....	Buffalo Townsite, Cobalt Lake.	Cobalt.
*McKinley Mines Security Co.....	Cobalt.....	Morrison.....	Nicol Tp.
Mining Corporation of Canada, Ltd.....	350 Bay St., Toronto.....	McKinley-Darragh.....	Coleman Tp.
*Morrison Mines, Ltd.....	Booth Bldg., Ottawa.....	Nipissing.....	Cobalt.
Mosher and McKay.....	Cobalt.....	O'Brien.....	Cobalt.
Nipissing Mines Co., Ltd.....	Excelsior Life Bldg., Toronto.	Miller Lake O'Brien.....	Gowganda.
O'Brien, M. V., Ltd.....	Ottawa Electric Bldg., Ottawa	Paramount.....	Tudhope.
O'Brien, M. V., Ltd.....	Ottawa Electric Bldg., Ottawa		Leith Tp.
Paramount Syndicate.....	New Liskeard.....		
Pioneer Prospectors, Con. Mines.....	Northern Ontario Bldg., Toronto.		
Price, C. W.....	Cobalt.....	Foster.....	Coleman Tp.
Sandoe and Moyle.....	Box 815, Cobalt.....	Temiskaming.....	Coleman Tp.
Seguin, H.....	Cobalt.....	Kerr Lake.....	Coleman Tp.
Shaw, J.....	New Liskeard.....	Tretheway.....	Coleman Tp.
*Shield Development Co., Ltd.....	815 Transportation Bldg., Montreal.	Old Cochrane.....	Cobalt.
Ward, R. G.....	Cobalt.....		Cobalt.

Silver-Lead-Zinc Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
*British Metal Corporation, Ltd.....	437 St. James St. W., Montreal	Stirling.....	Richmond County.
QUEBEC			
British Metal Corporation, Ltd.....	437 St. James S. W., Montreal	Tetreault.....	Montauban Tp.
*Clermont Mines, Ltd.....	85 St. Peter St., Quebec	Clermont.....	Clermont Tp.
*Federal Zinc and Lead Co., Ltd.....	602 Drummond Bldg., Montreal	Federal.....	Lemieux Tp.
*Huronian Belt Co., Ltd.....	Star Bldg., Toronto	Goodwin.....	Lemieux Tp.
*Lyal and Beidelman.....	Drummond Bldg., Montreal	Beidelman.....	Lemieux Tp.
New Montauban Zinc and Copper Co., Ltd.	33 Sous le Fort, Quebec	Notre Dame des Anges	Montauban Tp.
*St. Lawrence Metals, Ltd.....	132 St. James St., Montreal		Montauban Tp.
*Shawinigan Mining and Smelting Co....	1184 Philipps Place, Montreal	Montauban.....	Montauban Tp.
ONTARIO			
*Interprovincial Exploration Co., Ltd....	437 St. James St. W., Montreal	Interprovincial.....	Ben Nevis Tp.
Kingdon Mining and Smelting Co., Ltd.	1122 Beaver Hall Hill, Montreal	Kingdon.....	Galetta.
*Lake Geneva Mining Co., Ltd.....	Geneva.....	Collins.....	Hess Tp.
*Metals Development Ltd.....	702 Royal Bank Bldg., Toronto		Dent Tp.
Treadwell Yukon Co., Ltd.....	Bradley, Ont.....	Errington.....	Sudbury Dist.
BRITISH COLUMBIA			
Ainsworth Mining Division—			
*Aero Mines Corporation.....	321 Ginitelle Bldg., Spokane, Wash.	Riverside.....	Houser Lake.
*Caledonia Mine.....	Zincton, B.C.	Caledonia.....	Blaylock.
Davys, M. L.....	Kaslo	Davys Mill.....	Blaylock.
Empee Mining Co., Ltd.....	714 Yorkshire Bldg., Vancouver.	Black Prince, Two Friends.	Slocan City.
Giegerich, H.....	Kaslo	Banker, Montezuma.	Kaslo Creek.
Helme, F.....	Kaslo	Silver Bear.....	Kaslo Creek.
*Keystone-Charleston Mines, Ltd.....	Kaslo	Keystone.....	Retallack.
Kootney Florence Mining Co., Ltd....	35 Commerce Bldg., Vancouver.	Kootney Florence.....	Princess Creek.
Spokane-Trinket Mines.....	Kaslo	Spokane-Trinket.....	Ainsworth.
Sturgis Creek Mines, Ltd.....	501, 1st St. W., Calgary, Alta.	Ravenue.....	Kaslo.
Arrow-Lake Mining Division—			
*Consolidated Mining and Smelting Co., Ltd.	Trail, B.C.	Hailstorm.....	Burton.
Fort Steele Mining Division—			
*Consolidated Mining and Smelting Co., Ltd.	Trail.....	Estella.....	Fort Steele.
Consolidated Mining and Smelting Co., Ltd.	Trail.....	St. Eugene.....	Moyie.
Consolidated Mining and Smelting Co., Ltd.	Trail.....	Sullivan.....	Kimberley.
*Moyie River Mining & Dev. Co., Ltd.	Box 939, Fernie, B.C.	Royal Crown.....	Moyie River.
*St. Eugene Extension Mines Ltd.....	214 Pemberton Bldg., Victoria	St. Eugene Extension..	Moyie.
Thompson, O. C.....	Salmo	North Star.....	Kimberley.
Greenwood Mining Division—			
Beaver Silver Mines Ltd.....	509 Union Bldg., Victoria	Beaver.....	Yale Dist.
Beaverdell Wellington Syndicate Ltd.	Greenwood, B.C.	Wellington.....	Beaverdell.
Henderson, T. T.....	Box 782 Kelowna, B.C.	Duncan.....	Wallace Mt.
Highland Lass Ltd.....	Beaverdell.	Highland Lass.....	Beaverdell.
McIntosh and Lee.....	Mullan, Idaho.	Bell.....	Wallace Mt.
Providence Mine Leasing Co., Ltd....	Penticton	Providence.....	Yale Dist.
Sally Mines Ltd.....	Stone Newton Abbot, South Devon, Eng.	Sally.....	Wallace Mt.
Spencer-Stanhope, P. B.....	205 Standard Stock Exchange Bldg., Spokane, Wash.	Bounty.....	Wallace Mt.
*Wellington Mines Ltd.....	Box 520, Greenwood.	Wellington.....	Retallack.
White, Geo.....		Elkhorn.....	Greenwood.
Kamloops Mining Division—			
*Cotton Belt Mines Ltd.....	736 Granville St., Vancouver.	Meadow View.....	Similkameen.
Planet Mines and Reduction Co., Ltd.	402 Pender St. W., Vancouver.	Planet.....	Nicola.
*Smuggler Hill Development Co., Ltd.	Box 383, Kamloops.	Smuggler.....	Birch Island.
Laradeau Mining Division—			
Teddy Glacier Mines Ltd.....	804 Standard Bank Bldg., Vancouver.	Teddy Glacier.....	Camborne.
Multiplex Mining, Milling & Power Co.	Camborne, B.C.	Spider.....	Camborne.
Lillooet Mining Division—			
*Mineral Mountain Mines Ltd.....	612 Metropolitan Bldg., Vancouver.	Mineral Mt.....	Anderson Lake.
Nanaimo Mining Division—			
*Monton Woolsey Cons. Mines Ltd....	413 Granville St., Vancouver.	Dorothy Monton.....	Phillips Arm.

Silver-Lead-Zinc Mining Industry—Continued

Name	Address	Name of Mine	Location
<i>BRITISH COLUMBIA—Continued</i>			
<i>Nass River Mining Division—</i>			
Silver Crest Mines Ltd.	Commerce Bldg., Vancouver.	Silver Crest.	Hastings Arm.
*Utility Mines Ltd.	470 Granville St., Vancouver.	Tiger.	Alice Arm.
<i>Nelson Mining Division—</i>			
*Boundary Basin Mines Ltd.	1201 Vancouver Block, Vancouver.	Red Bird.	Waneta.
Consolidated Mining and Smelting Co., Ltd.	Trail.	Hunter V.	Ymir.
Goodenough Mine.	Ymir.	Goodenough.	W. Kootenay.
*Howard Mine Ltd.	Ymir.	Howard.	Porcupine Creek.
*Reeves MacDonald Mines Ltd.	614 Stock Exchange Bldg., Vancouver.	Reeves McDonald.	Salmo.
*Yankee Girl Consolidated Mines, Ltd.	35 Commerce Bldg., Vancouver.	Yankee Girl Enterprise.	Ymir.
Young, G. A. & J. E. Hayden.	Creston, B.C.	Delaware.	Kootenay.
<i>Omineca Mining Division—</i>			
Babine Bonanza Mining & Milling Co., Ltd.	Bank of Nova Scotia Bldg., Vancouver.	Babine Bonanza.	Smithers.
*Consolidated Mining and Smelting Co., Ltd.	Trail.	Emerald.	Omineca.
*Consolidated Mining and Smelting Co., Ltd.	Trail.	Lucky Jim.	Omineca.
Duthie Mines Ltd.	612 Pacific Bldg., Vancouver.	Duthie.	Smithers.
*Ingenika Mines Ltd.	506 Pacific Bldg., Vancouver.	Ingenika.	Ingenika River.
*Silver Island Mining Co., Ltd.	543 Granville St., Vancouver.	Silver Island.	Babine Lake.
<i>Osoyoos Mining Division—</i>			
B. E. Mining Co.	Leavenworth, Wash.	Oro Fine.	Oliver.
<i>Portland Canal Mining Division—</i>			
*Atlas Gold and Copper Mines Co., Ltd.	700 Hall Bldg., Vancouver.	Atlas.	Cassiar.
*Bitter Creek Mines Ltd.	Stewart.	Bitter Creek.	
Black Hill Mining Co., Ltd.	Stewart.	Black Hill.	
*Buena Vista Mining Co.	Trail.	Big Missouri.	Stewart.
*Comstock of B.C., Ltd.	4659 Stuart Bldg., Seattle, Wash.	Comstock.	Merritt.
Mayou Gold Copper Co., Ltd.	700 Hall Bldg., Vancouver.	Mayou.	Bitter Creek.
Melvin Mining Co., Ltd.	Stewart.	Melvin.	
*Porter Idaho Mines Co., Ltd.	London Bldg., Vancouver.	Porter Idaho.	Marmot River.
*Premier Border Gold Mining Co., Ltd.	313 Crown Bldg., Vancouver.	Premier Border.	Stewart.
*Silver Tip Mining Development Co., Ltd.	323 Sayward Bldg., Victoria.	Silver Tip.	Salmon River.
*Silverado Consolidated, Ltd.	London Bldg., Vancouver.	Silverado.	
*United Empire Gold & Silver Mining Co.	214 Standard Bank Bldg., Vancouver.	United Empire.	Bear River.
Woodbine Gold Mining Co., Ltd.	701 Pacific Bldg., Vancouver.	Woodbine.	Stewart.
<i>Queen Charlotte Islands Mining Division—</i>			
*Kitsault-Eagle Silver Mines Ltd.	312 Standard Bank Bldg., Vancouver.	Eagle Sunrise.	Alice Arm, Q.C. Islands.
<i>Revelstoke Mining Division—</i>			
*Lardeau Mines Exploration Ltd.	410 Seymour St., Vancouver.		Lardeau.
*Regal Silver Mines Ltd.	804 Standard Bank Bldg., Vancouver.	Regal.	
Snowflake Mining Co., Ltd.	418 Standard Bank Bldg., Vancouver.	Snowflake.	Albert Canyon.
*Wigwam Mining Co.	1217 Pacific Ave., Tacoma, Wash., U.S.A.	Wigwam.	
<i>Skeena Mining Division—</i>			
*Britannia Mining and Smelting Co., Ltd.	Britannia Beach.	Tonie Mine.	Alice Arm.
<i>Slocan Mining Division—</i>			
Ainslee, Ray F.	Silverton, B.C.	Westmount.	Slocan City.
American Boy Mining Co.	Box 171, Sandon.	Slocan-Sovereign.	Sandon.
Baldwin and Zachman.	315 Paulsen Bldg., Spokane, Wash.	Mary Ryan.	Sandon.
Blue Bird Mines, Ltd.	Kaslo.	Blue Bird.	Retallack.
Campbell, Colin J.	New Denver.	Bosun.	New Denver.
Canadian-Brandon.	Sandon.	Canadian-Brandon.	Sandon.
Cechelero, John and Partners.	New Denver.	Mt. Chief Mammoth.	New Denver.
Colonial Slocan Mines Ltd.	306 Vancouver Block, Vancouver.	Colonial.	
Consolidated Queen Bess Mines Ltd.	Alamo.	Queen Bess.	Alamo.
Conk-Province Mines Ltd.	Kaslo.	Conk-Province.	Nashton.
Cunningham Mines Ltd.	Alamo.	Alamo Mill.	Alamo.
Erupec Mining Co.	708 Yorkshire Bldg., Vancouver.	Two Friends.	Springer Creek.
Galena Farm Consolidated Mines Ltd.	614 Stock Exchange Bldg., Vancouver.	Hewitt, Galena Farm.	
Galena Farm Mine Ltd.	Silverton.	Galena Farm.	Silverton.
Gormley, G. T.	Alamo.	Monitor.	Three Forks.
Helenita Mines Ltd.	826 Centre St., Calgary, Alta.	Helenita.	
Jarvis, A.	Silverton.	Standard.	Silverton.
*Krao Mines Ltd.	Kaslo.	Krao.	Ainsworth.
*Leadsmith Mines Ltd.	Box 214, Spokane, Wash.	Noonday.	Sandon.
Lucky Jim.	614 Stock Exchange Bldg., Vancouver.	Lucky Jim.	

Silver-Lead-Zinc Mining Industry—Concluded

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—Concluded			
Lucky Thought Mines.....	Silverton.....	Lucky Thought.....	4 Mile Creek.
Minnesota Silver Co., Ltd.....	420 Lexington Ave., New York N.Y.	Ivanhoe.....	Sandon.
Molly Hughes Mines Ltd.....	318 Division St., Spokane.....	Molly Hughes.....	New Denver.
Noble Fine Mines Ltd.....	Nelson.....	Noble Fine Surprise.....	Sandon.
Paulsen and Porter.....	Sandon.....	Black Colt.....	Sandon.
Petty, Geo. A.....	Sandon.....	Victor.....	Sandon.
Ruth-Hope Mining Co., Ltd.....	614 Stock Exchange Bldg., Vancouver.	Ruth-Hope.....	Sandon.
*Silver Dollar Mines.....	Salmo.....	Silver Dollar.....	Salmo.
*Silversmith Mines Ltd.....	Sandon.....	Silversmith.....	Sandon.
Slocan Rambler Mining Co., Ltd.....	35 Commerce Bldg., Vancou- ver.	Slocan Rambler.....	New Denver.
Slocan Silver Mines Ltd.....	Alamo.....	McAllister.....	Three Forks.
*Standard Silver Lead Mining Co.....	Silverton.....	Wonderful.....	Sandon.
*Utica Mines Ltd.....	35 Commerce Bldg., Vancou- ver.	Utica.....	Keen.
*Van Roi Mines Ltd.....	Alamo.....	Van Roi.....	4 Mile Creek.
Victoria Syndicate, Ltd.....	614 Stock Exchange Bldg., Vancouver.	Hewitt Mill.....	
Western Exploration Co., Ltd.....	Silverton.....	Standard Mammoth.....	Silverton.
White, Oscar V.....	New Denver.....	Wakefield.....	4 Mile Creek.
Whitewater Mines Ltd.....	Kaslo.....	Whitewater.....	Retallack.
<i>Trail Creek Mining Division—</i> Cullinane and Moline.....	Rossland.....	I.X.L.....	O.K. Mountain.
Hackney Rose Hannah.....	Box 696 Rossland.....	Mayflower.....	Trail Creek.
<i>Trout Lake Mining Division—</i> *Spyglass-McLeod Mining Co., Ltd....	210 Pemberton Bldg., Victoria	Spyglass.....	Poplar Creek.
<i>Windermere Mining Division—</i> Paradise Holdings, Ltd.....	614 Stock Exchange Bldg., Vancouver.	Paradise.....	Invermore.
YUKON			
Bjornnes and Gordon.....	Keno Yukon Terr.....	Eureka.....	Sourdough Hill.
Keno Hill Ltd.....	120 Broadway, New York, N.Y.	Keno Hill.....	Mayo.
McKay, McIver, Forms and McIntosh	Keno Hill, Y.T.....	Shamrock.....	Keno Hill.
Treadwell Yukon Company, Ltd.....	Wernecke, Y.T.....	Wernecke.....	Mayo.

Tungsten Mining Industry

NOVA SCOTIA			
*Indian Path Gold Prospecting Syndi- cate.	464 Barrington St., Halifax....	Indian Path.....	Lunenburg Co.

NON-METAL MINING INDUSTRIES INCLUDING FUELS

FUELS

Coal Mining Industry

Name	Address	Location
NOVA SCOTIA—		<i>District</i>
Acadia Coal Co., Ltd.	Stellarton.	Pictou.
Boston Coal Co.	River Hebert.	Cumberland.
Bras d'Or Coal Co.	Little Bras d'Or Bridge.	Cape Breton.
Burke, Chas. (formerly Burke, Herbert & White)	Joggins Mines.	Cumberland.
Cumberland Railway and Coal Co.	Springhill.	Cumberland.
Dominion Coal Co., Ltd.	Glace Bay.	Cape Breton.
Enterprise Coal Co., Ltd. (formerly Lawson Coal Co.)	Amherst.	Cumberland.
Greenwood Coal Co., Ltd.	New Glasgow.	Pictou.
Indian Cove Coal Co., Ltd.	Sydney Mines.	Cape Breton.
Intercolonial Coal Mining Co., Ltd.	Westville.	Pictou.
Inverness Railway and Coal Co.	Inverness.	Inverness.
Maritime Coal, Railway and Power Co., Ltd.	Joggins Mines.	Cumberland.
Nova Scotia Steel and Coal Co.	Sydney Mines.	Cape Breton.
River Hebert Coal Coal.	River Hebert.	Cumberland.
Standard Coal Co., (formerly Emerson Coal Co., Ltd.)	River Hebert.	Cumberland.
Victoria Coal Co., Ltd., (operating No. 2 Mine, Minudie Coal Co.)	New Glasgow.	Cumberland.
NEW BRUNSWICK—		
Avon Coal Co., Ltd.	St. John.	Queens.
Chipman Coal Co. (formerly Burpee Construction Co.)	Chipman.	Queens.
Evans, W. B.	Minto.	Queens.
Minto Coal Co., Ltd.	St. John.	Queens.
Miramichi Lumber Co., Ltd.	Minto.	Queens.
Welton, Harvey.	Minto.	Queens.
Welton and Henderson.	Minto.	Queens.
SASKATCHEWAN—		<i>Municipality</i>
Bienfait Commercial Co.	Bienfait.	Near Bienfait.
Bienfait Mine.	Bienfait.	Near Bienfait.
Big Lump Coal Co.	Estevan.	Near Estevan.
Bourgoin, Louis.	Estevan, Box 287.	Near Estevan.
Crescent Collieries, Ltd.	Bienfait.	Near Bienfait.
Eastern Collieries of Bienfait, Ltd.	Estevan.	Near Estevan.
International Clay Products, Ltd.	Estevan.	Near Estevan.
Manitoba and Saskatchewan Coal Co., Ltd.	503 Avenue Block, Winnipeg, Man.	Bienfait.
Nicholson, H.	Estevan.	Estevan.
Parkinson, Geo.	Estevan.	Near Estevan.
Rollinson, W. H.	Estevan.	Estevan.
Shand Coal and Brick Co.	Shand.	Shand.
Western Dominion Collieries, Ltd.	305 Trust and Loan Bldg., Winnipeg, Man.	Taylorton.
ALBERTA—		<i>District</i>
<i>Bituminous—</i>		
Blue Diamond Coal Co., Ltd.	Brulé Mines.	Brulé.
Brazeau Collieries, Ltd.	Nordeg.	Nordeg.
Cadomin Coal Co., Ltd.	Cadomin.	Mountain Park.
Canmore Coal Co., Ltd.	Canmore.	Cascade.
Cartwright & Thomason (formerly Sunburst Coal Co.)	Blairmore.	Crowsnest.
Hillcrest Collieries, Ltd.	Hillcrest.	Crowsnest.
International Coal and Coke Co., Ltd.	Coleman.	Crowsnest.
Luscar Collieries, Ltd.	Edmonton.	Mountain Park.
McGillivray Creek Coal and Coke Co., Ltd.	Coleman.	Crowsnest.
Mohawk Bituminous Mines, Ltd.	Calgary.	Crowsnest.
Mountain Park Collieries, Ltd.	410 Tegler Bldg., Edmonton.	Mountain Park.
West Canadian Collieries, Ltd.	Blairmore.	Crowsnest.
<i>Sub Bituminous—</i>		
Alexo Coal Co., Ltd.	Alexo.	Saunders.
Bighorn and Saunders Creek Collieries, Ltd.	Saunders.	Saunders.
Bryan Coal Co., Ltd.	Adams Bldg., Edmonton.	Coalspur.
Coalspur Collieries, Ltd.	Coalspur.	Coalspur.
Coal Valley Mining Co., Ltd.	Coal Valley.	Coalspur.
Confederation Coal Co., Ltd. (formerly Northern Alberta Mines, Ltd.)	Covell.	Coalspur.
Foothills Collieries, Ltd.	Foothills.	Coalspur.
Jasper Coal Co., Ltd.	Edmonton.	Frairie Creek.
Lakeside Coal Co., Ltd. (formerly Balkan Coal Co., Ltd.)	Edmonton.	Coalspur.
McLeod River Collieries (formerly Saunders Ridge Coal Co., Ltd.)	Merco.	Coalspur.
Sterling Collieries Ltd.	Edmonton.	Coalspur.
Superva Coal Co., Ltd.	Lorett.	Coalspur.
<i>Lignite—</i>		
Alberta Block Coal Co., Ltd.	Drumheller.	Drumheller.
Albion Coal Co., Ltd.	Calgary.	Drumheller.
Arcadia Coal Co.	Calgary.	Drumheller.
Atlas Coal Co., Ltd.	East Coulee.	Drumheller.
Big Valley Collieries, Ltd.	Big Valley.	Big Valley.

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—Concluded		
<i>Lignite—</i>		
Bush Mines, Ltd.	1024-101A Avenue, Edmonton.	Edmonton.
Cadillac Coal Co., Ltd. (formerly Donaldson, C. S. Coal Co.)	Suite 1, Hill Block, Lethbridge.	Lethbridge.
Caledonian Collieries, Ltd.	Drumheller.	Drumheller.
Canadian Dinant Coal Co.	Dinant.	Camrose.
Canadian Pacific Railway Co.	Department of Natural Resources, Calgary.	Lethbridge.
Cardiff Coal Co.	Cardiff.	Edmonton.
City of Lethbridge Coal Mines.	Lethbridge.	Lethbridge.
Coal Producers, Ltd.	Calgary.	Pembina and Lethbridge.
Consolidated Diamond Collieries, Ltd.	Lethbridge.	Lethbridge.
Dawson Coal Co., Ltd.	7 McDougall Court, Edmonton.	Edmonton.
Dobell Coal Co., Ltd.	Tofield.	Tofield.
Drumheller Consolidated Collieries, Ltd.	Calgary.	Drumheller.
Eastern Alberta Coal Mines, Ltd.	Edmonton.	Tofield.
Elgin Coal Co., Ltd.	Drumheller.	Drumheller.
Elis Coal Co., Ltd.	Three Hills.	Carbon.
Excelsior Collieries, Ltd.	Wayne.	Drumheller.
Fox Coal Co.	Carbon.	Carbon.
Fraser McKay Collieries, Ltd.	1005½—101st. St., Edmonton.	Edmonton.
Great West Coal Co., Ltd. (Black Diamond Mine)	11026—101st St., Edmonton.	Edmonton.
Great West Coal Co., Ltd. (Star Mines).	Aerial.	Drumheller.
Hy-Grade Coal Co.	Drumheller.	Drumheller.
Ideal Coal Co., Ltd.	Wayne.	Drumheller.
Jewel Collieries, Ltd.	Wayne.	Drumheller.
Keith and Fulton Coal Co., Ltd.	Edmonton.	Edmonton.
Lakeside Coals, Ltd.	711 Tegler Bldg., Edmonton.	Pembina.
Leblanc, Emile (formerly Bay Coal Co., Ltd.)	Taber.	Taber.
Majestic Mines, Ltd. (formerly Leland Coal Co., Ltd.)	Taber.	Taber.
Maple Leaf Minerals, Ltd.	Drumheller.	Drumheller.
Marcus Coal Mines, Ltd.	10366—104th. St., Edmonton.	Edmonton.
Midland Coal Mining Co., Ltd.	Midlandvale.	Drumheller.
Minute Mine.	Drumheller.	Drumheller.
Monogram Coal Co.	Rosedale.	Drumheller.
Murray Collieries, Ltd.	Rosedale.	Drumheller.
Newcastle Coal Co., Ltd.	Drumheller.	Drumheller.
Newcastle Junior Mining Co.	Drumheller.	Drumheller.
Olyphant, J. H.	420-7th St., Medicine Hat & Carbon.	Carbon and Redcliff.
Ontala Collieries, Ltd.	Rosedale Station, Drumheller.	Drumheller.
Ottewell Coal Co.	Clover Bar.	Edmonton.
Palisade Coal Co., Ltd. (formerly Palisade Collieries, Ltd.)	Three Hills.	Carbon.
Parker, L. (formerly Sun Coal Co., Ltd.)	Cardiff.	Edmonton.
Peerless Carbon Collieries, Ltd.	Carbon.	Carbon.
Penn Mine Coal Co., Ltd.	10651-92nd St., Edmonton.	Edmonton.
Penn Mines, Ltd. (formerly Edmonton Collieries, Ltd.)	Fraser Flats, Edmonton.	Edmonton.
Premier Coal Co., Ltd.	109th Avenue, Edmonton.	Edmonton.
Rabbit Hill Collieries, Ltd.	Strathcona.	Edmonton.
Redcliff Brick and Coal Co., Ltd.	Redcliff.	Redcliff.
Rosedale Coal Co., Ltd.	Rosedale.	Drumheller.
Rose Deer Coal Mining Co., Ltd.	Wayne.	Drumheller.
Royal Lethbridge Collieries.	Box 5, Lethbridge.	Lethbridge.
Shannon Coal Co., Ltd.	Carbon.	Carbon.
Sinoski, M.	Strathcona.	Edmonton.
Sovereign Coal Mining Co., Ltd. (formerly Western Commercial Co., Ltd.)	Wayne.	Drumheller.
Stoney Creek Collieries, Ltd.	Camrose.	Camrose.
Sturgeon Valley Collieries, Ltd.	Carbondale.	Edmonton.
Sunbeam Coal Co., Ltd.	Ardley.	Ardley.
Superior Grade Coal Co., Ltd.	Wayne.	Drumheller.
Thomas, J. D., Coal Co.	Nacmine.	Drumheller.
Tofield Coal Co., Ltd.	Tofield.	Tofield.
Triangle Coal Co. (formerly Leech & Milne.)	Drumheller.	Drumheller.
Warnebaladt, Julius.	Sheerness.	Sheerness.
Watson, W. (formerly Big Valley Power & Mining Co., Ltd.)	Big Valley.	Big Valley.
Western Gem Coal Co., Ltd.	Drumheller.	Drumheller.
BRITISH COLUMBIA—		
Blue Flame Colliery (Formerly Coalmont Collieries, Ltd.)	Coalmont.	Inland.
Canadian Collieries (Dunsmuir) Ltd.	Nanaimo.	Inland.
Chambers, R. H. (Little Ash Mine)	Nanaimo.	Inland.
Corbin Collieries, Ltd.	Corbin.	Crow's Nest Pass.
Crow's Nest Pass Coal Co., Ltd.	Fernie.	Crow's Nest Pass.
East Wellington Coal Co.	Belmont House Victoria.	Inland.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Cassidy.	Inland.
Lynden Coal Mines, Ltd.	Princeton.	Inland.
Middlesboro Collieries, Ltd.	Merritt.	Inland.
Pleasant Valley Mining Co., Ltd.	Princeton.	Inland.
Tulameen Coal Mines, Ltd.	Princeton.	Inland.
Western Fuel Corporation of Canada, Ltd.	Nanaimo.	Inland.

District

Natural Gas Industry.

Name	Address	Location
NEW BRUNSWICK— New Brunswick Gas and Oilfields, Ltd.....	Box 196, Moncton.....	<i>Field</i> Stoney Creek, Albert Co.
ONTARIO— Ajax Oil and Gas Co.....	501 Federal Bldg., Toronto.....	Dover W.
Allen, J. D.....	Lowbanks.....	Moulton.
Beer, Geo.....	Binbrook.....	Binbrook.
Benn, A. S.....	Hagersville.....	Walpole.
Binbrook Gas Co.....	Binbrook.....	Binbrook.
Border Cities Syndicate.....	47 Elgin St., Brantford.....	Onondaga.
Canada Cement Co., Ltd.....	Box 29, Montreal, Que.....	Wainfleet.
Canboro Gas and Oil Co.....	Selkirk.....	Canboro, Cayuga N. and Seneca.
Canby, B. F.....	R. R. No. 2, Wainfleet.....	Wainfleet.
Canfield Natural Gas Co., Ltd.....	Canfield.....	Cayuga N.
Central Pipe Line Co., Ltd.....	Chatham.....	Bayham, Houghton, Middleton.
Chippewa Development Co., Ltd.....	Chippewa.....	Willoughby.
Cliff Gas Co., Ltd.....	Welland.....	Moulton, Canboro.
Coleman, J. A.....	Wellandport.....	Wainfleet, Gainsboro.
Dominion Natural Gas Co., Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Binbrook, Bayham, Canboro, Caistor, Charlotteville, Cayuga, N. Cayuga S., Dunn, Glanford, Houghton, Middleton, Malahide, Moulton, Onondaga, Oneida, Rainham, Seneca, Walpole, Walsingham S., Walsingham N., Windham, Woodhouse, Townend.
Dunn Natural Gas Co., Ltd.....	Dunnville.....	Dunn and Sherbrooke.
Eastside Gas Co.....	R. R. 2, Lowbanks.....	Sherbrooke.
Ellsworth, F.....	Box 391, Pt. Colborne.....	Wainfleet.
Erie Gas and Oil Co.....	Fisherville.....	Rainham.
Fisherville Gas Co.....	Fisherville.....	Rainham.
Fisherville Gas Co., No. 2.....	Fisherville.....	Rainham.
Fletcher, J. D.....	R. R. 1, Hamon.....	Binbrook.
Gifford, Arthur and Son.....	R. R. 2, Cayuga.....	S. Cayuga.
Haldimand Gas Fields Syndicate.....	Cayuga.....	Cayuga N.E., Rainham.
Hart and Harrington.....	Dunnville.....	Canboro.
Held, Fred.....	Fisherville.....	Rainham.
Hill, A. W.....	Coatsworth.....	Tilbury E.
Hoffman, Albert.....	R. R. 2, Dunnville.....	Moulton.
Industrial Natural Gas Co., Ltd.....	Thorold.....	Bertie, Crowland, Humberstone.
Jasperson, B.....	Kingsville.....	Gosfield South and Tilbury E.
Jones, J. S.....	Port Maitland.....	Dunn.
Kindy, D. and Son.....	Selkirk.....	Rainham.
Lincoln Gas Co., Ltd.....	Grimsby.....	Gainsboro, Canboro, Caistor.
Medina Natural Gas Co., Ltd.....	215 King St. W., Chatham.....	Bayham, Houghton and Middleton.
Michener, E. L.....	Wainfleet.....	Wainfleet.
Midfield Natural Gas Co., Ltd.....	421 King St. E., Hamilton.....	N. Cayuga and Oneida.
Nesbitt, O. L.....	Dunnville.....	Moulton.
Nelles Corners Gas Syndicate.....	Nelles Corners.....	Cayuga N. and Rainham.
New Azoff Gas Co., Ltd.....	Canboro.....	Cayuga N.
Niece Hosea and Son.....	R. R. 2, Lowbanks.....	Sherbrooke.
Northern Gas and Gasoline Co.....	Hepworth.....	Anabel.
North Shore Gas Co., Ltd.....	Selkirk.....	Rainham.
Oil Springs Oil and Gas Co., Ltd.....	Oil Springs.....	Enniskillen.
Ontario Salt Co., Ltd.....	Hamilton.....	Dorchester N.
Patterson, W. C.....	Jamestown, N.Y., U.S.A.....	Cayuga N., Cayuga S. and Dunn.
Petrol Oil and Gas Co., Ltd.....	307 York Bldg., Toronto.....	Dover West and Tuscarora.
Port-Colborne-Welland Natural Gas and Oil Co., Ltd.....	Port Colborne.....	Oneida, Onondaga and Seneca.
Provincial Natural Gas and Fuel Co., of Ontario, Ltd.....	Niagara Falls.....	Bertie, Crowland, Humberstone and Willoughby.
Rainham Gas and Oil Syndicate.....	Fisherville.....	Rainham.
Sarnia Gas and Oil Co.....	Sarnia.....	Sarnia.
Sehram and Saunders.....	Welland.....	Moulton.
Seneca Gas Syndicate.....	Dunnville.....	Dunn and Seneca.
Smith, R. H.....	Lowbanks.....	Moulton.
South Cayuga Gas Syndicate.....	R. R. 2, Cayuga.....	Cayuga S.
Southern Ontario Gas Co., Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Mersea, Raleigh, Romeny and Tilbury East.
South Sarnia Properties, Ltd.....	Sarnia.....	Sarnia.
Springvale Gas and Oil Co., Ltd.....	Hagersville.....	Walpole.
Sterling Gas Co., Ltd.....	Port Colborne.....	Humberstone, Moulton, Sher- brooke and Wainfleet.
Stevensville Natural Gas and Fuel Co.....	Stevensville.....	Bertie.
Stoney Creek Gas Syndicate.....	Selkirk.....	Rainham.
Sundy Gas Well Co.....	Dunnville.....	Canboro.
Union Natural Gas Co. of Canada, Ltd.....	52 Fifth St., Chatham.....	Tilbury E., Romney, Raleigh, Dover, Dawn, Euphemia.
United Gas Companies, Ltd.....	518 Jackson Bldg., Buffalo, N.Y., U.S.A.....	Canboro, Cayuga N., Moulton, Seneca, Wainfleet.
Vacuum Gas and Oil Co., Ltd.....	701 Federal Bldg., Toronto.....	Middleton.
Van Sickle, A. W.....	Onondaga.....	Onondaga.
Wainfleet-Moulton Gas Co.....	R. R. 1, Lowbanks.....	Moulton and Wainfleet.

Natural Gas Industry—Concluded

Name	Address	Location
MANITOBA—		
Bosc, Francois.....	Rathwell.....	Rathwell.
Clement, F.....	Waskada.....	Waskada.
Haskill, E. C.....	Box 64, Treherne.....	Treherne.
ALBERTA—		
Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat.....	Medicine Hat.
Associated Oil and Gas Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Bow Island Gas Plant.....	Bow Island.....	Bow Island.
Canada Cement Co., Ltd.....	Canada Cement Co., Bldg., Mont- real, P.Q.....	Medicine Hat.
Canadian Pacific Railway Co.....	Montreal, P.Q.....	Medicine Hat.
Canadian Western Natural Gas, Light, Heat and Power Co., Ltd.....	215-6th Ave. W., Calgary.....	Bow Island, Brooks, Barnwell, Foremost and Turner Valley.
Canadian Western Power and Fuel Co., Ltd.....	Redcliff.....	Redcliff.
Dalhousie Oil Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Dominion Glass Co., Ltd.....	1111 Beaver Hall Hill, Montreal, P.Q.....	Redcliff.
Foothills Oil and Gas Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Gypsy Oil, Ltd.....	636 Tegler Bldg., Edmonton.....	Wainwright.
Higgins, Estate of.....	Suffield.....	Suffield.
Home Oil Co.....	606-2nd St. W., Calgary.....	Turner Valley.
Hudson's Bay Oil and Gas Co., Ltd.....	407 Herald Bldg., Calgary.....	Viking.
Illinois-Alberta Oils, Ltd.....	211 Lancaster Bldg., Calgary.....	Turner Valley.
Maple Leaf Oil Co., Ltd.....	1007 Stock Exchange Bldg., Vancou- ver, B.C.....	Wainwright.
Maple Leaf Milling Co., Ltd.....	Toronto, Ont.....	Medicine Hat.
McLeod Oil Co., Ltd.....	507 Grain Exchange, Calgary.....	Turner Valley.
Medicine Hat Brick and Tile Co., Ltd.....	Medicine Hat.....	Medicine Hat.
Medicine Hat, Corporation of.....	Medicine Hat.....	Medicine Hat.
New McDougall-Segur Oil Co., Ltd.....	38 Union Bldg., Calgary.....	Turner Valley.
Northwestern Utilities, Ltd.....	10305 Jasper Ave., Edmonton.....	Viking.
Ogilvie Flour Mills Co., Ltd.....	Montreal, P.Q.....	Medicine Hat.
Ontario-Alberta Oil Development Co.....	56 Imperial Bank Bldg., Toronto.....	Suffield.
Redcliff Brick and Coal Co., Ltd.....	Box B 5, Redcliff.....	Redcliff.
Royalite Oil Co., Ltd.....	606-2nd St. W., Calgary.....	Turner Valley.
Spooner Oils, Ltd.....	Bank of Commerce Chambers, Calgary.....	Turner Valley.
United Electric and Engineering Co., Ltd.....	721-11th St. W., Calgary.....	Bassano.
United Natural Gas Development Co., Ltd.....	200-203 Leeson-Lineham Bldg., Cal- gary.....	Foremost.
Wainwell Oils, Ltd.....	114 Union Trust Bldg., Toronto, Ont.....	Wainwright.
Wetaskiwin, Corporation of.....	Wetaskiwin.....	Wetaskiwin.
Wainwright Gas Co., Ltd.....	36 Dominion Bank Bldg., Edmonton	(Distributing Company).

Petroleum Industry

		Field
NEW BRUNSWICK		
New Brunswick Gas and Oilfields, Ltd.....	Box 196, Moncton.....	Stoney Creek, Albert Co.
ONTARIO—		
Ajax Oil and Gas Co., Ltd.....	85 Richmond St. W., Toronto.....	Thamesville.
Anderson Bros. and Thompson.....	Oil Springs.....	Oil Springs.
Anderson, J. H.....	Oil Springs.....	Oil Springs.
Armstrong, J. E.....	Petrolia.....	Enniskillen.
Atkinson, John.....	R. R. 3, Petrolia.....	Enniskillen.
Atkinson, Wm.....	R. R. 3, Petrolia.....	Plympton.
Bailey, John.....	Petrolia.....	Moore.
Baker, Jas.....	R. R. 3, Petrolia.....	Enniskillen.
Barrett, C. H.....	Petrolia.....	Enniskillen.
Bernelle, Thos.....	Petrolia.....	Moore.
Bowles, Herbert.....	Petrolia.....	Sarnia.
Bradley, R. N.....	Lowbanks.....	Enniskillen.
Brook, T. A.....	Petrolia.....	Enniskillen.
Brown, W. J.....	.....	Moore.
Bruce, A.....	Oil.....	Moore.
Byers, Lydia.....	Oil Springs.....	Oil Springs.
Canada Crude Oil Producers, Ltd.....	Petrolia.....	Petrolia.
Canadian Oil Refineries Co., Ltd.....	200 Bay St., Toronto.....	Petrolia and Enniskillen.
Carleton, W. G.....	R. R. 2, Petrolia.....	Enniskillen.
Carman and Fairbank.....	Petrolia.....	Bothwell.
Chesher, Geo.....	Petrolia.....	Sarnia.
Colchester Oil Co.....	Toronto.....	Thamesville.
Collins, Thos.....	Petrolia.....	Petrolia.
Copeland, John.....	Petrolia.....	Enniskillen.
Coulter, James.....	R. R. 3, Petrolia.....	Moore.
Crocker-Parks Oil Co., Ltd.....	Oil Springs.....	.....
Crotty and Elliot.....	Bothwell.....	Bothwell.
Deacon, F. W.....	Petrolia.....	Petrolia.
Dennis, C.....	Oil Springs.....	Oil Springs.
Dennis, E.....	Petrolia.....	Plympton.
Dominion Petroleum Co., Ltd.....	Glencoe.....	Mosa.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—Continued		
Donald, Geo.	Oil Springs.	Oil Springs.
Drope, Geo.	R. R. 4, Copelston.	Enniskillen.
Duncan Bros.	R. R. 3, Petrolia.	Moore.
Edward, F. H.	Box 125, Petrolia.	Enniskillen.
Elliot, C. H.	Corunna.	Sarnia.
Elliot, K. G.	R. R. 2, Sarnia.	Enniskillen.
Elliot, Henry.	Petrolia.	Moore.
Ewart, Jas.	R. R. 1, Wyoming.	Plympton.
Fairbank, C. O., Estate.	Petrolia.	Oil Springs.
Fairbank, J. H., Estate.	Petrolia.	Oil Springs.
Font, A.	Petrolia.	Moore.
Forsythe, A.	Copelston.	Petrolia and Enniskillen.
Gillespie, Wm.	Petrolia.	Petrolia.
Goudie, John.	Petrolia.	Enniskillen.
Gregory, Henry.	Petrolia.	Enniskillen.
Griffin, Geo. B.	R. R. 1, Sarnia.	Sarnia.
Halliday, Henry.	R. R. 2, Sarnia.	Sarnia.
Hamlin, F. G.	Petrolia.	Petrolia.
Hardy, Chas.	R. R. 2, Sarnia.	Sarnia.
Hastie, Wm.	R. R. 2, Sarnia.	Sarnia.
Heal, John.	Petrolia.	Moore.
Hillis, T. J. and Sons.	Oil Springs.	Oil Springs.
Houston, Mrs. Annie.	Petrolia.	Petrolia.
Howlett, Fred.	Petrolia.	Petrolia.
Jewell, Dan.	Oil Springs.	Oil Springs.
Johns, Wm.	Wyoming.	Plympton.
Josh, Thos.		Enniskillen.
Kelly, J. F.	Box 706, Petrolia.	Petrolia and Enniskillen.
Kerr, John, Estate.	Petrolia.	Petrolia and Enniskillen.
Kerr, Mrs. Ross.	Sarnia.	Enniskillen.
Kettle, Robt.	Petrolia.	Enniskillen.
Kirk, Elmer.	Petrolia.	Moore.
Lammy, H.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Levine, H.	Petrolia.	Petrolia and Enniskillen.
Levitt, C.	Wyoming.	Plympton.
Lewis, J. J., Estate.	Oil Springs.	Oil Springs.
Lidster, Geo. H.	Dunwich.	
Logan, Herbert.	Petrolia.	Petrolia and Enniskillen.
Logan, Leslie.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Loxton, Thos.	Petrolia.	Petrolia and Enniskillen.
Maw, F. W.	Petrolia.	Petrolia and Enniskillen.
McAlpine.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
McColl, Ed.	Petrolia.	Petrolia and Enniskillen.
McGaffey, Richard.	Bothwell.	Bothwell.
McGillivray, Geo. A.	201 Mt. Pleasant Ave., London.	Oil Springs.
McKay, John.	Sarnia.	Sarnia.
McLean, L.	Newbury.	Bothwell.
McLellan, Walter.	R. R. 3, Petrolia.	Moore.
McManus, Alex.	Wyoming.	Plympton.
McNaughton, J. D.	R. R. 2, Newbury.	Mosa.
McRitchie, C. A.	Bothwell.	Bothwell.
Mitchell, Charles.	Oil Springs.	Oil Springs.
Mitchell, Wesley.	Sarnia.	Sarnia.
Miller, F. J.	R. R. 2, Sarnia.	Sarnia.
Miller, W. W.	R. R. 3, Petrolia.	Moore.
Mills, A. J.	Corunna.	Sarnia.
Morningstar and Jackson.	Oil Springs.	Oil Springs.
Morningstar, L. H.	Oil Springs.	Oil Springs.
Morris, Geo.	Petrolia.	Petrolia and Enniskillen.
Mott, Ed. J.	Oil Springs.	Oil Springs.
Mott and Mitchell.	Oil Springs.	Oil Springs.
Mutual Oil Producing Co.	195 Dundas St., London.	Petrolia.
Napper, Fred.	Petrolia.	Petrolia and Enniskillen.
Ontario Lands and Oil Co., Ltd.	Petrolia.	Petrolia and Enniskillen.
Owens, R. H.	Petrolia.	Petrolia and Enniskillen.
Parks, Mrs. E. M.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Portsmouth, T.	Petrolia.	Petrolia and Enniskillen.
Petrol Oil and Gas Co., Ltd.	307 York Bldg., Toronto.	Dover W.
Rainsberry, N. J.	Petrolia.	Sarnia.
Rainsberry, Walter.	Petrolia.	Petrolia and Enniskillen.
Rawson, A.	Petrolia.	Petrolia and Enniskillen.
Rawson, Wallace.	R. R. 3, Petrolia.	Petrolia and Enniskillen.
Redick, W. O.	R. R. 3, Petrolia.	Plympton.
Richardson, Geo.	Wyoming.	Plympton.
Ruckle, H.	Petrolia.	Sarnia.
Schumacher, Bowen E.	112 Adams St., Chicago, Ill., U.S.A.	Petrolia and Enniskillen.
Smith, T. E.	R. R. 2, Sarnia.	Sarnia.
Sproule, Bros.	Oil Springs.	Oil Springs.
Stevenson, G. L.	Petrolia.	Petrolia and Enniskillen.
Stonehouse Bros.	Petrolia.	Moore.
Summit Oil Co.	610 Union Trust Bldg., Rochester, N.Y., U.S.A.	Bothwell.
Tuer, J. T.	Wyoming.	Plympton.
Vacuum Gas and Oil Co.	85 Richmond St., Toronto.	Thamesville.
Walker Oil and Gas Co., Ltd.	129 Chatham St. W., Windsor.	Bothwell.
Walen, Alex C.	Oil Springs.	Oil Springs.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—Concluded		
Wallen, John, Estate.....	Oil Springs.....	Oil Springs.
Wallen and Wallen, Estate.....	Oil Springs.....	Oil Springs.
Walsh, T.....	Petrolia.....	Petrolia and Enniskillen.
Warwick, Joseph.....	Oil Springs.....	Oil Springs.
Watt, R. J.....	London.....	Petrolia and Enniskillen.
Willits, Geo. E.....	Bothwell.....	Bothwell.
Winnett, J. W. G.....	Bothwell.....	Bothwell.
Woodward, John.....	Oil Springs.....	Oil Springs.
Woodward, Wm.....	Oil Springs.....	Oil Springs.
Yerkes, Carl.....	Petrolia.....	Petrolia and Enniskillen.
Young, W. E.....	Wyoming.....	Plympton.
SASKATCHEWAN—		
<i>Drilling—</i>		
Citizens Oil & Gas Co., Ltd.....	Saskatoon.....	Unity Valley.
Pike Lake Oil & Gas Development and Exploration Co., Ltd.....	Saskatoon.....	Pike Lake.
Rosetown Leaseholding & Development Co., Ltd.....	Rosetown.....	Mountain View.
Simpson Oil Co., Ltd.....	Simpson.....	Simpson.
Unity Valley Oil Co., Ltd.....	207 Lancaster Bldg., Calgary, Alta.	Unity Valley.
ALBERTA—		
<i>Producing—</i>		
Associated Oil & Gas Co., Ltd.....	606—2nd St. W., Calgary.....	Turner Valley.
British Dominion Oil & Development Corporation, Ltd.....	211 Dominion Bank Bldg., Calgary.....	Turner Valley.
Calmont Oils, Ltd.....	400 Lancaster Bldg., Calgary.....	Turner Valley.
Dalhousie Oil Co.....	606—2nd St. W., Calgary.....	Turner Valley.
Foothills Oil & Gas Co., Ltd.....	606—2nd St. W., Calgary.....	Turner Valley.
Gypsy Oils, Ltd.....	636 Tegler Bldg., Edmonton.....	Wainwright.
Home Oil Co., Ltd.....	535 Georgia St., Vancouver, B.C.....	Turner Valley.
Illinois-Alberta Oils, Ltd.....	211 Lancaster Bldg., Calgary.....	Turner Valley.
McLeod Oil Co., Ltd.....	507 Grain Exchange, Calgary.....	Turner Valley.
New McDougall-Segur Oil Co., Ltd.....	38 Union Bldg., Calgary.....	Turner Valley.
Okalta Oils, Ltd.....	1015 Herald Bldg., Calgary.....	Turner Valley.
Ribstone Oils, Ltd.....	914 Lancaster Bldg., Calgary.....	Ribstone.
Royalite Oil Co., Ltd.....	606—2nd St. W., Calgary.....	Turner Valley.
Sasko-Wainwright Oil & Gas Co., Ltd.....	713 Canada Life Bldg., Saskatoon, Sask.....	Wainwright.
Sioux City Oils, Ltd.....	410 Maclean Block, Calgary.....	Turner Valley.
Spooner Oils, Ltd.....	Bank of Commerce Chambers, Calgary.....	Turner Valley.
United Oils, Ltd.....	200-203 Leeson-Lineham Block, Calgary.....	Turner Valley.
Vulcan Oils, Ltd.....	Vulcan.....	Turner Valley.
Wainwell Oils, Ltd.....	114 Union Trust Bldg., Toronto, Ont.....	Wainwright.
<i>Drilling only—</i>		
Admiral Oils Ltd.....	37 Canada Life Bldg., Calgary.....	Wainwright.
Advance Oil Co., Ltd.....	522 P. Burns Bldg., Calgary.....	Turner Valley.
Alberta Gas and Fuel Co., Ltd.....	Pincher Creek.....	Champion.
Anaconda.....	202 Traders Bldg., Calgary.....	Turner Valley.
Angus Oils Ltd.....	522 P. Burns Bldg., Calgary.....	Waite Valley.
Baltac Oils Ltd.....	200-3 Leeson-Lineham Blk., Calgary.....	Turner Valley.
Banner Oils Ltd.....	312-313 Alberta Corner, Calgary.....	Sinclair-Highwood.
Beaumont Oils Ltd.....	Brandon, Man.....	Wainwright.
Bethwain Oils Ltd.....	23 Toronto St., Toronto, Ont.....	Wainwright.
Bugle Oils Ltd.....	51 Standard Bank Bldg., Winnipeg, Man.....	Milk River.
Calgary Development & Producers, Ltd.....	606—2nd St. W., Calgary.....	Waite Valley.
Commonwealth Petroleum Ltd.....	410 Lancaster Bldg., Calgary.....	Blood Indian Reserve, Milk River and Turner Valley.
Dalfin Petroleum Ltd.....	411 Lancaster Bldg., Calgary.....	Turner Valley.
Dauntless Oils Ltd.....	300 Leeson-Lineham Blk., Calgary.....	Skiff.
Devenish Petroleum Ltd.....	300 Leeson-Lineham Blk., Calgary.....	Skiff.
Dome Oils, Ltd.....	200-3 Leeson-Lineham Blk., Calgary.....	Turner Valley.
Duluth Syndicate.....	Calgary.....	Kinsella.
Dutch America Oils Ltd.....	303 Maclean Block, Calgary.....	Turnet Valley.
Eagle Butte Oil Co., Ltd.....	Medicine Hat.....	Cypress Hills.
East Crest Oil Co., Ltd.....	Niagara Falls, Ont.....	Turner Valley.
Edalta Oils, Ltd.....	Wainwright.....	Wainwright.
Elbow Oil Co., Ltd.....	25 Michael Bldg., Calgary.....	Moose Mountain.
Fabyan Petroleums Ltd.....	820 Stock Exchange Bldg., Vancouver, B.C.....	Wainwright.
Freehold Oil Corp., Ltd.....	803 Lancaster Bldg., Calgary.....	Turner Valley.
Freeman & Lundy.....	107—6th Ave., Calgary.....	Turner Valley.
Frontier Developments Ltd.....	Bank of Commerce Bldg., Edmonton.....	Wildcat Hills.
Globe Oil Co., Ltd.....	Oyen.....	Fuego.
Globe Drilling Co., Ltd.....	10012—101a Ave., Edmonton.....	Pigeon Lake.
Herron Petroleum Ltd.....	507-8 Lancaster Bldg., Calgary.....	Bragg Creek.
High River Oilfields, Ltd.....	310 Leeson-Lineham Blk., Calgary.....	High River.
Highwood Petroleum & Natural Gas Co., Ltd.....	914 Lancaster Bldg., Calgary.....	Highwood.
Homestead Oils, Ltd.....	303 Beveridge Bldg., Calgary.....	Turner Valley.
Hyla Oils, Ltd.....	401 Maclean Block, Calgary.....	Turner Valley.
Indian Oils, Ltd.....	514 Maclean Block, Calgary.....	Rickert.
Invaders Petroleum Ltd.....	225A—8th Ave. W., Calgary.....	Turner Valley.
Kamrley Oils Ltd.....	Godman Bldg., Kamloops, B.C.....	Morley.

Petroleum Industry—Concluded

Name	Address	Location
ALBERTA—Concluded		
<i>Drilling only—Concluded</i>		
Lethbridge Petroleum & Refineries, Ltd.	106 P. Burns Bldg., Calgary.	Blood Indian.
Lowery Petroleum Ltd.	902 Stock Exchange Bldg., Vancouver, B.C.	Turner Valley.
Mayland Oil Co., Ltd.	606—2nd Ave. W., Calgary.	Turner Valley.
Mercury Oils, Ltd.	300 Lancaster Bldg., Calgary.	Turner Valley.
Merland Oil Co. of Canada, Ltd.	35 Commerce Bldg., Vancouver, B.C.	Turner Valley.
Mill City Petroleum, Ltd.	229—8th Ave. W., Calgary.	Turner Valley.
Miracle Oils, Ltd.	300 Lancaster Bldg., Calgary.	Turner Valley.
Model Oils, Ltd.	Suite 7, Cameron Block, Calgary.	Turner Valley.
Moose Oils, Ltd.	Calgary.	Moose Mountain.
Northwest Co., Ltd.	606—2nd Ave. W., Calgary.	Turner Valley.
Onalto Oils, Ltd.	Wainwright.	Wainwright.
Oxville Oil, Gas & Development Co., Ltd.	Oxville.	Ribstone.
Paramount Oils, Ltd.	407 Grain Exchange Bldg., Calgary.	Turner Valley.
Peninsular Petroleum, Ltd.	110 Adelaide St. W., Toronto, Ont.	Wainwright.
Ranchmen's Gas & Oil Co., Ltd.	509 Grain Exchange Bldg., Calgary.	Aldersyde.
Range Oil and Gas Co., Ltd.	414 Lancaster Bldg., Calgary.	Border.
Ranger Oil Co., Ltd.	410 Maclean Block, Calgary.	Turner Valley.
Regent Oil Co., Ltd.	Calgary.	Turner Valley.
Richfield Petroleum, Ltd.	225A—8th Ave. W., Calgary.	Waite Valley.
Roselite Oils, Ltd.	303 Beveridge Bldg., Calgary.	Waite Valley.
Sarcee Oil & Development Co., Ltd.	914 Lancaster Bldg., Calgary.	Sarcee Reserve.
Sentinel Oils, Ltd.	523 Loughheed Bldg., Calgary.	Turner Valley.
Sinclair-Morley Oil Structures Syndicate, Ltd.	604 Leeson-Lineham Bldg., Calgary.	Morley Reserve.
Southern Lowery Oils, Ltd.	902 Stock Exchange Bldg., Vancouver, B.C.	Turner Valley.
Southwest Petroleum Co., Ltd.	801 Dominion Bank Bldg., Toronto, Ont.	Turner Valley.
Sterling Pacific Oil Co., Ltd.	567 Burrard St., Vancouver, B.C.	Turner Valley.
Structure Oil & Gas Co., Ltd.	209 Lancaster Bldg., Calgary.	Turner Valley.
Twin Dome Oil Co., Ltd.	High River.	Twin Dome.
Vanalta Oils, Ltd.	511 Province Bldg., Vancouver, B.C.	Red Coulee.
Vanberta Oils Ltd.	412 Yorkshire Bldg., Vancouver.	Turner Valley.
Vimy Oils Ltd.	708 Centre St., Calgary.	Turner Valley.
Wabash Oils Ltd.	Calgary.	Morley.
Wainwright Petroleum, Ltd.	Molson's Bank Bldg., Edmonton.	Wainwright.
Warner Oils Ltd.	531 Loughheed Bldg., Calgary.	Highwood.
Wellington Oil & Gas Co., Ltd.	200-203 Leeson-Lineham Block, Calgary.	Turner Valley.
Western Alberta Oil Co., Ltd.	232 Portage Ave., Winnipeg, Man.	Highwood-Sinclair.
Weyman Petroleum Ltd.	605-7 Loughheed Bldg., Calgary.	New Black Diamond.
Widney Oils, Ltd.	Calgary.	Turner Valley.

OTHER NON-METAL MINING INDUSTRIES

Actinolite Mining Industry

Name	Address	Location
ONTARIO—		
Actinolite Mining Co., Ltd.	111 Beaver Hall Hill, Montreal, P.Q.	Elzevir, Tp.

Asbestos Mining Industry

Name	Address	Mine	Township
QUEBEC—			
Asbestos Corporation, Ltd.	Canada Cement Co. Bldg., Montreal	Asbestos.	E. Broughton.
		Beaver.	Coleraine.
		Boston.	Broughton.
		British Canadian.	Coleraine.
		Consolidated.	Thetford.
		King.	Thetford.
		Maple Leaf.	Coleraine.
		Vimy Ridge.	Ireland.
		Bell.	Thetford.
		Greenshield.	Coleraine.
		Jeffrey.	Shipton.
		Johnson's.	Thetford.
		Johnson's.	Coleraine.
		Quebec.	Thetford.
			E. Broughton.
Bell Asbestos Mines Inc.	Ambler, Pa., U.S.A.		
Canada Asbestos and Chrome Co.	Black Lake.		
Canadian Johns-Manville Co., Ltd.	450 St. James St., Montreal.		
Johnson's Company	Thetford Mines.		
Northern Asbestos Co., Ltd.	Thetford Mines.		
Quebec Asbestos Corporation, Ltd.	East Broughton.		

Barytes

Name	Address	Location
NOVA SCOTIA— Brandram-Henderson, Ltd.....	Box 190, Montreal, P.Q.....	East Lake Ainslie, Inverness Co.

Bituminous Sands

ALBERTA— Bituminous Sand Extraction Co., Ltd..... McMurray Asphaltum and Oil, Ltd.....	507 McLean Block, Calgary..... Petrolia, Ont.....	Fort McMurray District. Fort McMurray District.
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Diatomite

NOVA SCOTIA— Oxford Tripoli Sales, Inc.....	People's Bank Bldg., Harvestrav, N.Y., U.S.A.....	East New Annan.
BRITISH COLUMBIA— B.C. Refractories, Ltd.....	Ft. Smythe St., Vancouver.....	Quesnel.

Feldspar Mining Industry

ONTARIO— Bathurst Feldspar Mines, Ltd..... Craig, T. H..... Feldspar Quarries, Ltd..... Frontenac Floor and Wall Tile Co., Ltd. Mill..... Genesee Feldspar Co., Inc..... Hoey, D. H..... National Feldspar Co., Ltd..... Orser, S. H..... Wanup Feldspar Mines, Ltd.....	230 King St. E., Toronto..... Box 300 Perth Ont..... 506 National Bldg., Toronto..... Box 178, Kingston, Ont..... Hybla, Ont..... Britt, Ont..... 301 Royal Bank Bldg., Toronto..... Sydneyham, Ont..... Lucknow, Ont.....	Lanark County. Lanark County. Perth Area. Verona, Hybla. Verona, Hybla. Lanark County. Perth Road, Ont. Dill Tp.
QUEBEC— Brazeau, Maurice A..... Bon Ami, Ltd..... Cameron, J. J..... Donaldson, Robert J..... O'Brien and Fowler, Ltd..... Parker, Alfred..... Pedneaud, Gonzague..... Whitfield, T..... Whittemore, Mrs. A. R..... Winning, B.....	Buckingham, Que..... Drawer 166, Hochelaga, Montreal... Box 11, Buckingham, Que..... Glen Almond, Que..... Buckingham, Que..... Glen Almond, Que..... Buckingham, Que..... Buckingham, Que..... 475 Kent St., Ottawa, Ont..... N.D. de la Salette, Que.....	Fasley Lake. Aylwin Tp. Buckingham West. Buckingham Dist. Derry Tp. Derry Tp. Derry Tp. Derry Tp. Buckingham Tp.

Garnets

QUEBEC— Labelle Nickel and Garnet Co., Ltd..... Langlade Garnet Syndicate.....	354 St. Catherine St. E., Montreal... 132 rue St. Pierre, Quebec.....	July Tp. Baudin Tp.
ONTARIO— Stockhauser, Chas. A.....	Madoc, Ont.....	Madoc Tp.
BRITISH COLUMBIA— Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail, B.C.....	Grand Forks.

Graphite Mining Industry

ONTARIO— Black Donald Graphite Co., Ltd.....	Calabogie, Ont.....	Brougham Tp.
QUEBEC— Canadian Graphite Corp.....	Guenette, Que.....	Boyer Tp.

Grindstone Industry

Name	Address	Location
NOVA SCOTIA— Murphy Logan.....	Balmoral Mills.....	Waugho River.
NEW BRUNSWICK— Miramichi Quarry Co., Ltd..... Read Stone Co., Ltd.....	Quarryville, N.B..... Stonehaven, N.B.....	Quarryville. Stonehaven.
BRITISH COLUMBIA— McDonald, J. A. and C. H.....	Vancouver.....	

Gypsum Mining Industry

NOVA SCOTIA— Atlantic Gypsum Products Co..... Canadian Gypsum Co., Ltd..... Connecticut Adamant Plaster Co..... Iona Gypsum Products..... North American Gypsum Co..... Nova Scotia Coal and Gypsum Co., Ltd..... Windsor Plaster Co., Ltd..... Windsor Gypsum Co.....	40 Central St., Boston, Mass..... Windsor, N.S..... Walton, N.S..... Sydney, N.S..... Baddeck, N.S..... Box 13, Mabou, N.S..... Windsor, N.S..... Box 727 Newburgh, N.Y.....	Walton, Cheticamp. Wentworth Creek. Hants County Baddeck Bay. Mabou Harbour. Windsor. Newport Station.
NEW BRUNSWICK— Albert Manufacturing Co..... Fraser, Donald.....	511 Canada Cement Bldg., Montreal. Plaster Rock, N.B.....	Hillsborough. Plaster Rock.
ONTARIO— Canada Gypsum and Alabastine Ltd.....	Paris, Ont.....	Caledonia, Lythmore.
MANITOBA— Canada Gypsum and Alabastine Ltd.....	Box 3057 Winnipeg, Man.....	Gypsumville.
BRITISH COLUMBIA— Canada Cement Co., Ltd..... Canada Gypsum and Alabastine, Ltd.....	Canada Cement Bldg., Montreal..... 509 Richards St., Vancouver.....	Mayook. Falkland.

Iron Oxide Industry

QUEBEC— Argall, Thos. H..... Canada Paint Co., Ltd..... Montmorency Paint Products Co., Ltd.....	La Pointe du Lac, Que..... 2875 Centre St., Montreal..... 1100 Craig St. E., Montreal.....	Champlain Co. Beaupre, Que.
BRITISH COLUMBIA— Davidson, J. G.....	3498 Maurice Drive, Vancouver.....	Mons, B.C.

Magnesite Mining Industry

QUEBEC— International Magnesite Co., Ltd..... Scottish Canadian Magnesite Co., Ltd.....	Harrington East, Que..... 30 Halton Ave, Montreal.....	Harrington Tp. Grenville, Tp.
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Manganese Bog

NEW BRUNSWICK— Brunswick Mineral Development Co.....	Hillsborough, N.B.....	Albert County.
BRITISH COLUMBIA— Carle, A. J.....	Ainsworth.....	Ainsworth.

Mica Mining Industry

QUEBEC— Blackburn Bros., Ltd..... Cross, W. C..... Ellard, Ellen Miller..... Flynn, H. T..... Laurel Mining Co., Ltd..... Martin, A. G..... McGlashen, R. J..... Nault, J. B.....	Blackburn Bldg., Ottawa..... Cascades, Que..... Wright, Que..... 31 Montcalm St., Hull, Que..... 4 Rue des Forges, Trois Rivières..... 236 Besserer St., Ottawa..... 190 Montcalm St., Hull..... Maniwaki, Que.....	East Templeton, Que. Hull Tp. Alley, Tp. Argenteuil County. Hull Tp. Wakefield. Cameron Tp.
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Mica Mining Industry—Concluded

Name	Address	Location
ONTARIO—		
Bennett, H. V.....	Perth, Ont.....	
Burke, Jas.....	Perth, Ont.....	
Kent Bros.....	114 Gore St., Kingston, Ont.....	Bedford Tp.
Lee, W. W.....	Bedford Mills, Ont.....	Buck Lake.
Loughborough Mining Co., Ltd.....	Sydenham, Ont.....	Frontenac County.
Martin, A. G.....	236 Besserer St., Ottawa.....	Portland, Ont.
Powers, T. G.....	Stanleyville, Ont.....	Bedford Mills.

Mineral Waters Industry

QUEBEC—		
Abenakis Springs Co.....	Abenakis Springs, Que.....	Yamaska Co.
Roy, L. A.....	St. Germain, Que.....	L'Islet Plate.
L'eau Naturelle Purgative de Chambord.....	Desbiens, Que.....	Chambord.
ONTARIO—		
Canada Dry Ginger Ale, Ltd.....	6380 St. Urbain St., Montreal.....	Caledonia Springs.
Carlsbad, Ltd.....	Carlsbad Springs.....	Gloucester Tp.
Deneault, F.....	Bourget, Ont.....	
Goderich Mineral Water Co.....	Goderich, Ont.....	Goderich.
Gurd, Chas. & Co., Ltd.....	1016 Bleury St., Montreal.....	Caledonia Tp.
Sanitaris, Ltd.....	Arnprior, Ont.....	Packenham Tp.

Phosphate Mining Industry

QUEBEC—		
Blackburn Bros.....	Blackburn Bldg., Ottawa.....	Templeton Tp.
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Co., Ltd.....	Trail, B.C.....	Fernie, B.C.

Pyrites Mining Industry

ONTARIO—		
Canadian Pyrites, Ltd.....	Guardian Bldg., Clevalend, O.....	Flower Station.
BRITISH COLUMBIA—		
Britannia Mining and Smelting Co., Ltd.....	Britannia Beach, B.C.....	Vancouver, B.C.

Quartz Mining Industry

NOVA SCOTIA—		
River Dennis Sand and Clay Co.....	Port Hood, N.S.....	
QUEBEC—		
Cameron, J. J.....	Box 11, Buckingham, Que.....	Buckingham.
Canadian Carborundum Co., Ltd.....	Niagara Falls, Ont.....	St. Canut, Que.
Canada Glass Products.....	193 Main St., Hull, Que.....	
Donaldson, R. J.....	Glen Almond.....	Buckingham.
Mason, James H.....	803 St. Clarens Ave., Toronto.....	Guigues, Que.
Montpetit, Euclide.....	Melocheville, Que.....	
O'Brien and Fowler, Ltd.....	Buckingham, Que.....	Derry Tp.
Parcher, Alfred.....	Glen Almond, Que.....	Derry.
Pedneaud, Gonzague.....	Buckingham, Que.....	
Silico, Ltd.....	Summer Bldg., Montreal.....	St. Canut.
Winning & Downing.....	Notre Dame de la Salette, Que.....	Buckingham, Tp.
MANITOBA—		
Lake Bar Sand and Gravel Co.....	Water St., Winnipeg, Man.....	
BRITISH COLUMBIA—		
Consolidated Mining & Smelting Co., Ltd.....	Trail, B.C.....	Penticton.
Granby Consolidated Mining & Smelting Co., Ltd.....	Hall Bldg., Vancouver.....	Nass River M. D.

Salt Industry

Name	Address	Location
NOVA SCOTIA— Malagash Salt Co.....	New Glasgow, N.S.....	Malagash...
ONTARIO— Brunner, Mond Canada, Ltd..... Canadian Industries, Ltd..... Dominion Salt Co., Ltd..... Goderich Salt Co., Ltd..... Kincardine Salt Co., Ltd..... Western Canada Flour Mills Co., Ltd..... Western Salt Co., Ltd.....	501 Dominion Bank Bldg., Toronto.. Box 1260, Montreal, Que..... Sarnia, Ont..... Goderich, Ont..... Kincardine..... 287 MacPherson Ave., Toronto..... Courtright, Ont.....	Amherstburg.. Sandwich.. Sarnia.. Goderich.. Kincardine.. Goderich.. Courtright.

Silica Brick Industry

NOVA SCOTIA— Dominion Iron and Steel Co., Ltd.....	Sydney, N.S.....	Cape Breton.
ONTARIO— Algoma Steel Corporation, Ltd.....	Sault Ste. Marie, Ont.....	

Sodium Carbonate Mining Industry

BRITISH COLUMBIA— British Columbia Chemical Co., Ltd..... Dominion Soda Producers, Ltd.....	410 Seymour St., Vancouver..... 744 Hastings St. W., Vancouver.....	Clinton, B.C.. Cariboo.
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Sodium Sulphate Mining Industry

SASKATCHEWAN— Bishopric and Lent Co..... Sodium Sulphate Refining Co., Ltd..... White Stone Salts & Chemical Co., Ltd.....	Gerke Bldg., Cincinnati, Ohio..... 513 Longhead Bldg., Calgary..... North Battleford, Sask.....	Expanse.. Fusiliers.. Polo, Sask.
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Talc and Soapstone Industry

QUEBEC— Robertson Soapstone & Quarry Co., Ltd.....	Broughton Station, Que.....	Broughton.
ONTARIO— Canada Talc Co., Ltd..... Gillispie, Geo. H. & Co., Ltd.....	Madoc, Ont..... Box 232, Madoc.....	Madoc, Ont.... Madoc.
BRITISH COLUMBIA— B.C. Refractories, Ltd.....	Georgia Viaduct, Vancouver.....	Anderson Lake.

Volcanic Dust Industry

SASKATCHEWAN— Van-Kel Chemical Co., Ltd.....	Swift Current, Sask.....	Beverley.
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CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

CLAY PRODUCTS INDUSTRY

Brick and Tile

Name	Address	Location
NOVA SCOTIA—		
Brooks, Geo. & Sons.....	New Glasgow.....	Plymouth.
Brooks, Stephen & Sons.....	Box 359, New Glasgow.....	New Glasgow.
Miller Jas. B.....	Elmsdale.....	Barney Brook.
Nova Scotia Clay Works, Ltd.....	Box 140 Halifax.....	Elmsdale.
Shaw, L. E., Ltd.....	Avonport.....	Avonport.
NEW BRUNSWICK—		
Ryan, M. & Son, Ltd.....	Woodstock Road, Fredericton.....	Fredericton.
Shaw, L. E., Ltd.....	Chipman.....	Chipman.
QUEBEC—		
Ascot Till and Brick Co., :Ltd.....	Ascot, Que.....	Cancon Ascot.
Bell, W. and D.....	1286 St. Valier St., Que.....	Little River Road.
Citadel Brick, Ltd.....	14 St. Joseph St., Quebec.....	Levis, Co.
Chicoutimi Brick Ltd.....	Chicoutimi.....	Chemin St. Paul.
Cooksville, Co., Ltd.....	320 Canada Cement Bldg., Montreal.....	Delson.
Eastern Townships Brick and Tile Co., Ltd.....	East Angus, Que.....	East Angus.
Frontenac Brick, Ltd.....	140 Rue St. Jean, Quebec.....	Quebec Co.
Hodgins, David T.....	Shawville, Que.....	Clarendon, Co.
Islet Brick Co., Ltd.....	L'Islet, Que.....	L'Islet Station.
Lennoxville Brick and Tile Co., Ltd.....	Lennoxville, Que.....	Lennoxville.
Longpre, Emile.....	St. Felix de Valois, Que.....	
Lotbiniere Brick Ltd.....	Deschailions, Que.....	Deschailions.
National Brick Co. of Laprairie, Ltd.....	Canada Cement Bldg., Montreal.....	Laprairie, Delson.
St. Tite Industry.....	St. Tite, Que.....	St. Tite.
St. Lawrence Brick Co., Montreal.....	29 Rue St. Jacques W., Montreal.....	Laprairie.
Scott Brick Co., Ltd.....	Scott Junction.....	Dorchester Co.
Standard Clay Products.....	St. Johns, Que.....	St. Johns.
ONTARIO—		
Baird and Son.....	Parkhill, Ont.....	Parkhill.
Barnhardt, W. H.....	Stratford, Ont.....	Stratford.
Batchelor, Samuel.....	Proton Station, R.R. 3.....	Artemessia.
Bay of Quinte Brick Works.....	Belleville, Ont.....	Belleville.
Booth Brick and Lumber Co.....	Box 61 New Toronto.....	Etobicoke Tp.
Brampton Pressed Brick, Ltd.....	Brampton, Ont.....	
Broodwell, B. and Son.....	Kingsville, Ont.....	Gasfield South.
Butwell, Richard.....	107 Lake Shore Road, Humber Bay.....	Humber Bay.
Caledon Shale-Brick, Ltd.....	1167 Bay St., Toronto.....	Caledon Tp.
Campbell, N. F. and Sons.....	West Lorne, Ont.....	Aldborough, Tp.
Canadian Fire Clay Products, Ltd.....	605 Adelaide St. E., Toronto.....	New Toronto.
Canadian Pressed Brick Co., Ltd.....	195 Ottawa St. S., Hamilton.....	Hamilton.
Casemore and Sons.....	Shallow Lake, Ont.....	
Chapman Bros.....	104 Dawes Rd., Toronto.....	East York Tp.
Chapman, J.....	R.R. 3, Napanee, Ont.....	N. Fredericksburgh Tp.
Cooksville Co., Ltd.....	120 St. James St., Montreal.....	Cooksville, Ont...
Cornhill, James and Sons, Ltd.....	Grand Ave., Chatham.....	Chatham, Tp.
Cooper, W. H.....	608 Lister Block, Hamilton.....	Hamilton.
Cowell Bros.....	Tillsonburg.....	
Curtin, Frank.....	R.R. 4, Lindsay.....	Lindsay.
Curtis Bros.....	Box 839, Peterboro.....	Otonabee Tp.
Dalton, Mark.....	Dresden, R.R. No. 3.....	Dawn Tp.
De LaPlante, J. E. and Co.....	Coleman, P.O., Ont.....	East York Tp.
Deller, Albert and Son.....	Brownsville.....	Brownsville.
Deller Bros.....	R.R. 2, Norwich.....	North Norwich.
Deller, Wm. H.....	R.R. 4, Thorndale.....	West Missouri.
Denison Tile Co., Ltd.....	24 Wyandotte St. E., Windsor.....	Tilbury East, Rochester Tp.
Doehart Brick, Tile and Terra Cotta Works.....	Arnprior, Ont.....	Arnprior.
Dolan, John.....	R.R. 2, Watford.....	Warwick Tp.
Donaldson and Son.....	R.R. 4, Harriston.....	Minto Tp.
Donaldson, Thomas George.....	R.R. 1, Greenock.....	Culross Tp.
Douglas and Douglas.....	Wilkesport.....	Sombra Tp.
Don Valley Brick Works L. d.....	324 Federal Bldg., Toronto.....	York Tp.
Elliott Chas.....	Bluevale.....	
Elliott James Jr.....	519 Wellington St. W., Sault Ste. Marie.....	Norah Tp.
Elliott, Wm.....	Glenannan, R.R. 1.....	Culross Tp.
Frid Bros.....	Dundas Road, Hamilton.....	Dundas and Macklin.
Gammager, C. R.....	R.R. 2, Dresden.....	Canden Tp.
Gardiner, Wm.....	Box 83, Blenheim.....	Howick Tp.
Godfrey, Thomas and Co.....	Carleton Place.....	Beckwith.
Grimsby Brick and Tile, Ltd.....	Grimsby.....	Grimsby.
Haist, R. W.....	Crediton.....	
Hallatt and Son.....	Comber.....	Comber.
Hallatt, W. Clay Products.....	4 Richards Blk., Chatham.....	Raleigh Tp.
Halton Brick Co., Ltd.....	28 Symes Rd., Toronto 9.....	Halton Co.
Hamilton Pressed Brick Co., Ltd.....	Kensington Ave. S., Hamilton.....	Hamilton.
Hill, Aaron.....	Box 217, Essex.....	Essex.

Brick and Tile—Continued

Name	Address	Location
ONTARIO—Concluded		
Hill, A. W.	R.R. 1, Coastworth	Tillbury East.
Hitch, H. A.	Ridgetown	
Hitch, Thomas	1st Ave., St. Thomas	Yarmouth Tp.
Hodder, Mrs. J. H. and Sons	Dutton	Hungrick Tp.
Housten Co., Ltd.	Box 130, Belleville	Hungrick Tp.
Howlett, F. W. and Sons, Ltd.	Box 3, Petrolia	Petrolia.
Huntsville Brick Works	Huntsville	Chaffey Tp.
Interprovincial Brick Co., Ltd.	26 Queen St. E., Toronto	Halkon Co.
Jackson, W. B.	290 Rawdon St. Brantford	Brantford.
Jameson, J. A.	Renfrew	Renfrew.
Janes, D. A.	Mt. Brydges	Caradoc Tp.
Jervis, W. J.	R.R. 3, Dorchester	N. Dorchester Tp.
Johnson, James Sr.	Pembroke, R. R. 3	Stafford Tp.
Jasperson Brick and Tile Co.	Box 586 Kingsville	Coatsworth.
Kerr, Frederick	Crediton	
Koehel Bros.	Box 54, St. Clements	Wellesly Tp.
Lindsay, Earl	R.R. 2, Wallaceburg	Chatham Tp.
Martin, Thos. E.	Thamesville	Howard Tp.
Maw, Wm. T.	Minesing	
McComb, Chester	R.R. 2, London	London Tp.
McCormick Bros.	R.R. 5, Watford	Warwick Tp.
McEachern and Sons	Highgate	Highgate.
McFarren, F. B., Ltd.	18 Toronto St., Toronto	
McFarlane, W. J.	Box 143 Forest	Forest.
McMahon, Robert	R.R. 2, Kerwood	Metcalfe Tp.
Middleton, Chas.	Wyoming	Plympton Tp.
Milton Brick, Ltd.	1158 Bay St., Toronto	Milton.
Miner, Manly F.	Kingsville	
Moulton, John	Holyrood, R.R. 2	Greenock Tp.
National Sewer Pipe Co., Ltd.	Aldershot	Aldershot.
New Liskeard Brick Works	Box 74 New Liskeard	New Liskeard.
Ontario Brick and Tile Plant	Prov. Sec. Ontario Govt., Toronto	Mimico.
O'Reilly, T. E.	320 Bay St., Ottawa	Prescott Road.
Ott Brick and Tile Mfg. Co., Ltd.	33 King St. E., Kitchener	Kitchener.
Ottawa Brick and Terra Cotta Co., Ltd.	Billings Bridge	Gloucester Tp.
Ottman Bros.	111 Macklin St., Hamilton	Hamilton.
Owen Sound Brick Co., Ltd.	Owen Sound	Owen Sound.
Parke, H. N.	R.R. 2, Dresden	Camden Tp.
Paxton, Fred. R.	70 Herrick Ave., St. Catharines	St. Catharines.
Pembroke Brick Co.	Pembroke	Pembroke.
Phinn Brick Co.	St. James Park, London, Ont.	Westminster Tp.
Phinn, Geo. A.	238 Briscoe Ave., London	
Phippen and Field	Box 11, Coleman	East York Tp.
Pigott, Geo. and Co.	72 Guestville Ave., Toronto	York Tp.
Piper, Murphy and Piper	509 Victoria Ave., Fort William	Fort William.
Port Rowan Brick and Tile Co.	Port Rowan	Port Rowan.
Price and Cummings	Salisbury Ave., Thunder Bay	Humber Bay.
Price and Smith	458 Greenwood Ave., Toronto	
Richardson, J. and Son	Kerwood	Kerwood.
Russell Brick Co.	40 Blake St., Toronto	Toronto.
Sherman Clay Products, Ltd.	Kingsville	Rochester Tp.
Snelgrove A.	Beaverton	Thorah Tp.
Sproat, Wm. M.	R.R. 4, Seaforth	Tuckersmith Tp.
Standard Brick Co., Ltd.	500 Greenwood Ave., Toronto	Toronto.
Staples Brick and Tile Co.	Staples	Staples.
Stute, Edwin	Vankleek Hill	Vankleek Hill.
Stroh, M. C.	Conestogo	Woolwich.
Sun Brick and Tile Co., Ltd.	1104 Bay St., Toronto	Don Valley.
Superior Brick and Tile Co., Ltd.	426 Victoria Ave., Fort William	Paiponge Tp.
Sutherland W. A.	Box 293, Parkhill	Parkhill.
Telford, J. C.	Southwold Station	Southwold Station.
Thompson, R.	Hamfray	
Tope, R., Estate	945 King St. W., Hamilton	Hamilton.
Toronto Brick Co., Ltd.	397 Bay St., Toronto	Toronto.
Voakes and Son	Box 20 Ruscomb	Rochester Tp.
Wagstaff, Chas.	R.R. 4, Lindsay	
Wagstaff Brick Works	349 Greenwood Ave., Toronto	Toronto.
Waide, J. C.	Alvinston, Ont.	Alvinston.
Waite, John E.	Foresters Falls	Ross Tp.
Wallace, R. and Son	34 Main St. W., North Bay	Widdifield Tp.
Watson, W. S.	Thedford	Basanquet Tp.
Wein, Aaron	Crediton	Stephen Tp.
Weitzel, J. C.	Tavistock	
Winch, Stuart A.	Box 220, Paisley	Elderslie Tp.
Windsor Brick and Tile Co.	Windsor	Division Road.
Wright, Geo. and Sons	Box 56, Comber	Tillbury West Tp.
MANITOBA—		
Alsip Brick, Tile and Lumber Co., Ltd.	537 Portage Ave., Winnipeg	Winnipeg.
Marion, J. A.	Box 30, St. Boniface	St. Boniface.
National Clay Products, Ltd.	915 Somerset Blk., Winnipeg	Edrans.
Reliance Brick Co.	Whitemouth	
Snyder, A. and Co., Ltd.	Portage la Prairie	Portage la Prairie.
Snyder, M. and Sons	Gilbert Plains	Gilbert Plains.

Brick and Tile—Concluded

Name	Address	Location
SASKATCHEWAN—		
Bruno Clay Works, Ltd.....	Bruno.....	Bruno.
Dominion Firebrick and Clay Products, Ltd.....	106 Kern Bldg., Moose Jaw.....	Claybank.
International Clay Products, Ltd.....	Box 399, Estevan.....	Estevan, Prince Albert.
Shand Coal and Brick Co.....	Shand.....	Sec. 4-2-7, W. 2nd. M.
ALBERTA—		
Acme Brick Co., Ltd.....	125 Alberta Blk., Edmonton.....	Cannell Siding.
Crandell, E. H. Pressed Brick and Sandstone Co.	607 MacLean Block, Calgary.....	Brickburn.
Johnsen, Knut.....	Box 1722, Grande Prairie.....	Grand Prairie.
Little, J. B. and Sons, Ltd.....	9120—100 and E Ave., Edmonton.....	Edmonton.
Medicine Hat Brick and Tile Co., Ltd.....	Medicine Hat.....	Medicine Hat.
Redcliff Brick and Coal Co., Ltd.....	Redcliff.....	S. 5, T. 13, R. 6, W. 4th.
Redcliff Pressed Brick Co., Ltd.....	Redcliff.....	Redcliff.
Redcliff Premier Brick Co., Ltd.....	Box C2, Redcliff.....	Redcliff.
BRITISH COLUMBIA—		
Baker Brick and Tile Co., Ltd.....	Douglas St., Victoria.....	Victoria.
Clayburn Co., Ltd.....	302 West Hastings St., Vancouver.....	Kilgard.
Gabriola Shale Products, Ltd.....	Moody Blk., Victoria.....	Gabriola Island.
Haug, Wm. and Son.....	Box 166, Kelowna.....	Kelowna.
Pacific Brick, Ltd.....	801 Stock Exchange Bldg., Vancouver.....	New Westminster.
Port Haney Brick Co., Ltd.....	846 Howe St., Vancouver.....	Port Haney.
Smithers Brick Yard.....	Smithers.....	Smithers.
Vancouver Brick and Tile Co.....	2521 Maple St., Vancouver.....	Sullivan.
Victoria Brick Co., Ltd.....	Douglas St., Victoria.....	Victoria.

Clay Sewer Pipe

NOVA SCOTIA—		
Standard Clay Products, Ltd.....	St. Johns, Que.....	New Glasgow.
QUEBEC—		
Standard Clay Products, Ltd.....	St. Johns, Que.....	St. Johns.
ONTARIO—		
National Sewer Pipe Co., Ltd.....	Aldershot.....	(Hamilton. Mimico.)
ALBERTA—		
Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat, Alta.....	Dunmore.
BRITISH COLUMBIA—		
Clayburn Co., Ltd.....	850 W. Hastings St., Vancouver.....	Clayburn.

Firebrick, Fireclay and Fireclay Products

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd.....	Sydney.....	Sydney.
NEW BRUNSWICK—		
Foley Pottery, Ltd.....	Lock Lomond Rd., St. John.....	St. John.
QUEBEC—		
Montreal Terra Cotta Co., Ltd.....	Drummond Bldg., Montreal.....	Lakeside.
ONTARIO—		
National Fire Proofing Co., Ltd.....	601 Dominion Bank Bldg., Toronto..	Aldershot.
ALBERTA—		
Alberta Clay Products Co., Ltd.....	Box 672, Medicine Hat.....	Dunmore-Ravensrag.
BRITISH COLUMBIA—		
B. C. Refractories, Ltd.....	Georgia Viaduct, Vancouver.....	Vancouver.
Clayburn Co., Ltd.....	850 Hastings St. W., Vancouver.....	Kilgard.

Stoneware and Pottery

NEW BRUNSWICK—		
Foley Pottery, Ltd.....	Lock Lomond Rd., St. John.....	St. John.
ONTARIO—		
Davis, John and Son, Ltd.....	601 Merton St., Toronto.....	Merton St., Toronto.
Foster Pottery, Co.....	Main St. W., Hamilton.....	Hamilton.
ALBERTA—		
Medalta Potteries, Ltd.....	Medicine Hat.....	Medicine Hat.

Other Structural Materials.

Cement Industry

Name	Address	Location
QUEBEC—		
Canada Cement Company, Ltd.....	Canada Cement Bldg., Montreal....	Hull.
National Cement Co.....	Box 2770, Montreal.....	Montreal East.
ONTARIO—		
Canada Cement Company, Ltd.....	Canada Cement Bldg., Montreal....	{Belleville. Lakefield. Welland county.
St. Mary's Cement Co., Ltd.....	357 Bay St., Toronto.....	St. Mary's.
MANITOBA—		
Canada Cement Company, Ltd.....	Canada Cement Bldg., Montreal....	Fort Whyte.
ALBERTA—		
Canada Cement Co., Ltd.....	Canada Cement Bldg., Montreal....	Exshaw.
Marlboro Cement Co.....	Edmonton.....	Marlboro.
BRITISH COLUMBIA—		
British Columbia Cement Co., Ltd.....	305 Belmont Bldg., Victoria.....	Bamberton.

Lime Industry

NOVA SCOTIA—		
Eastern Lime Co., Ltd.....	Windsor.....	Windsor.
Nat. Trust Co. (Dominion Iron & Steel).....	Sydney.....	Point Edward.
NEW BRUNSWICK—		
Bathurst Power and Paper Co., Ltd.....	Bathurst.....	Port Daniel.
Peters, C. H. and Sons, Ltd.....	71 Dock St., Saint John.....	Torriburn.
Purdy and Green.....	323 Main St., St. John.....	St. John.
Snowflake Lime, Ltd.....	3 Pokiok Rd., St. John.....	St. John.
QUEBEC—		
Baron, A.....	St. Dominique.....	St. Dominique.
Beaudry, A.....	Joliette.....	Joliette.
Boivin, Arthur.....	Pont Rouge.....	Pont Rouge.
Canada Lime and Stone, Ltd.....	St. Marc des Carrières.....	
Dominion Lime Co.....	East Angus.....	Lime Ridge.
Ducharme, Colbert.....	Guigues, etc. Temiscamingue.....	Guigues.
Heon, Octave.....	St. Louis de France.....	St. Marguerita.
Lalumière, Joseph.....	St. Dominique de Bagot.....	St. Dominique de Bagot.
Laurentian Stone Co.....	250 Catherine St., Ottawa, Ont.....	Hull.
Limoges, Fils & Cie.....	552 rue Papart, Montreal.....	St. Michel.
Shawinigan Chemicals, Ltd.....	83 Craig St., Montreal.....	Bedford.
Standard Lime Co., Ltd.....	Joliette.....	{St. Paul de Joliette. St. Marc des Carrières.
Stinson-Reeb Builders' Supply Co., Ltd.....	360 Dorchester St. W., Montreal....	
ONTARIO—		
American Cyanamid Co.....	535 Fifth Ave., New York, N.Y.....	Beachville.
Beachville Lime and Stone, Ltd.....	Paris, Ont.....	Beachville.
Biederman, Albert G.....	Golden Lake R.R. 1.....	Golden Lake.
Brunner-Mond Canada, Ltd.....	501 Dominion Bank Bldg., Toronto.....	Anderdon.
Cameron, W. M.....	Carleton Place.....	Carleton Place.
Canada Gypsum and Alabastine, Ltd.....	Elora.....	Elora.
Canada Lime Co., Ltd.....	Coboconk.....	Coboconk.
Chalmers Lime Works.....	689-7th St. W., Owen Sound.....	Owen Sound.
Dominion Rock Products, Ltd.....	1017 New Birks Bldg., Montreal....	Eganville.
Dominion Sugar Co., Ltd.....	Chatham.....	{Wallaceburg. Chatham.
Gallagher Lime and Stone Co., Ltd.....	Upper James St., Hamilton.....	Barton Tp.
Gypsum, Lime and Alabastine Co.....	Paris.....	Limehouse.
Jamieson Lime Co.....	Renfrew.....	Puslinch Tp.
Kinkley, H.....	Napanee.....	Horton Tp.
Shane Lime Co.....	Eganville.....	Eganville.
Standard White Lime Co.....	15 Douglas St., Guelph.....	Guelph.
Toronto Brick Co., Ltd.....	897 Bay St., Toronto.....	Coboconk.
Weppler, Henry.....	R.R. 2, Priceville.....	Glenelg Tp.
MANITOBA—		
Canada Gypsum and Alabastine Co.....	Box 3057, Winnipeg.....	
Gillis Quarries, Ltd.....	Richard Ave., Winnipeg.....	Garson.
Moosehorn Lime Co., Ltd.....	214 Avenue Block, Winnipeg.....	Moosehorn.
Winnipeg Supply and Fuel Co., Ltd.....	214 Avenue Block, Winnipeg.....	Stonewall.
ALBERTA—		
Loder's Lime Co., Ltd.....	Kananaskis.....	Kananaskis.
Summit Lime Works.....	Box 273, Lethbridge.....	S. ½, S. 7, Tp. 8, R. 5, W. 5.
BRITISH COLUMBIA—		
Hedley Gold Mining Co.....	Hedley.....	Hedley.
Pacific Lime Co., Ltd.....	744 Hastings St. W., Vancouver.....	Texada Island.
Pacific Mills, Ltd.....	Standard Bank Bldg., Vancouver.....	Gunboat Pass.
Rosebank Lime Co.....	744 Hastings St. W., Vancouver.....	Esquimalt.

Sand and Gravel

Name	Address	Location
NOVA SCOTIA—		
Campbell, J. J. and Son.....	Boisdale.....	Boisdale.
Foundation Co. of Can., Ltd.....	Guy and Sherbrooke St., Montreal.....	Milton.
MacNeil Bros.....	Box 593, North Sydney.....	Sydney Mines.
Mosher, Walter.....	307 Portland St., Dartmouth.....	Elmsdale.
Norrie, Henry J.....	R.R. 6, Truro.....	
Nova Scotia Dept. of Highways.....	Halifax.....	Long Island, Falleigh Lake.
Nova Scotia Power Commission.....	Halifax.....	Pembroke Shore.
Routledge, W. F.....	Reserve Mines, C.B.....	Lingan, C.B.
Walker, Adam.....	Bridgetown.....	
NEW BRUNSWICK—		
Canadian Independent Oil, Ltd.....	Box 729, St. John.....	East St. John.
Likely, Jos. A.....	St. John.....	East St. John.
Maxwell, Chas. O.....	R.R. 3, St. Stephen.....	Charlotte County.
QUEBEC—		
Alcoa Power Co. Ltd.....	Box 620 Kenagami.....	Simard Canton.
Asbestos Corporation.....	Thetford Mines.....	Thetford, Tp.
Belanger, Joseph.....	Ascot Corner.....	
Belisle, Euclide.....	Coaticook.....	Coaticook.
Benjamin, Pierre.....	197 St. Pierre, St. John.....	Mt. St. Gregoire.
Benoit, J. A.....	Mt. St. Gregoire.....	Mt. St. Gregoire.
Bergeron, Ursin.....	Jonquiere.....	Jonquiere.
Bishop, Wm. I., Ltd.....	New Birks Bldg., Montreal.....	Lievre River.
Blais, Jos.....	10 Ave. Mont-Marie, Levis.....	St. Romuald.
Boa, Wm. F.....	R.R. 3, Lachute.....	
Bourgeois, Edmond.....	St. Albert.....	
Bonner Sand and Ballast, Ltd.....	1434 St. Catherine St. W., Montreal.....	Durham Tp.
Brault, Wm.....	16—1st Ave. S., Sherbrooke.....	Orford Canton.
Boivin, Thomas.....	7 Ave. Lafontaine, Chicoutimi.....	Chicoutimi.
Brault, F. X.....	St. Dominique.....	St. Dominique.
Brault, D.....	St. Alexandre.....	St. Alexandre.
Breen, Thos.....	Chemenis.....	Dassarat.
Brouillet Sand and Gravel Co., Ltd.....	Rawdon.....	St. Julien.
Canadian Import Co.....	83 Dalhousie St., Quebec.....	St. Charles River.
Canadian Johns-Manville Co.....	Asbestos.....	Shipton Tp.
Cantin, Chas.....	St. Romuald.....	St. Romuald.
Cloutier, J. F.....	100 Rue Cartier, Chicoutimi.....	Chicoutimi.
Coaticook Town.....	100 Child St., Coaticook.....	Coaticook.
Consolidated Oka Sand and Gravel Co., Ltd.....	248 McCord St., Montreal.....	St. Maurice River.
Construction Society.....	7 Ave. Lafontaine.....	Chicoutimi.
Coté, Eli.....	Hébertville.....	Lake St. John.
Dalcourt, Henri.....	R.R. 1, St. Felix de Valois.....	St. Felix de Valois.
Deslandes, Mastai.....	St. Dominique.....	St. Dominique.
Dominion Sand and Stone Co., Ltd.....	865 Roy St. E., Montreal.....	South Durham.
Dubreuil, Albert.....	St. Dominique.....	St. Dominique.
Dubuc, J. E. A.....	Chicoutimi.....	Chicoutimi.
Dupuis, H. and Sons, Ltd.....	Maisonneuve St., Hull.....	Hull.
Gagné, Mde. B. A.....	Boischatel.....	Boischatel.
Gagnon and Potvin.....	St. Joseph d'Alma.....	Lake St. John.
Gagnon, Louis Philippe.....	St. David de Lévis.....	St. Telephore.
Granger, Ildege.....	St. Marie Salome.....	St. Marie Salome.
Guerdin, Arsene.....	Belœil.....	St. Hilaire.
Hemmingford Municipality.....	Hemmingford.....	Huntingdon.
Houde, Fred. Dr.....	8 Du Platon St., Three Rivers.....	Three Rivers.
Independent Sand Co., Ltd.....	3731 Notre Dame St. E., Montreal.....	Lake St. Peter.
Le Beau, Adelard.....	St. Dominique.....	St. Dominique.
Letourneau, Arthur.....	St. Remi.....	St. Remi.
Massicotte, J. E.....	Arvida.....	Rivière du Moulin.
Montreal City.....	City Hall, Montreal.....	St. Felix de Valois.
Montreal Harbour Commission.....	City Hall Montreal.....	St. Lawrence River.
Paradis, G. H.....	Hébertville.....	Hébertville.
Paradis, Pitre.....	Hébertville.....	Hébertville.
Pepin, L. A.....	159 St. Roch, Three Rivers.....	
Poliquin, Napoléon.....	42 St. Henri St., Sherbrooke East.....	Ascot Tp.
Prefontaine, Octave.....	Belœil.....	Belœil.
Quebec City.....	City Hall, Quebec.....	Beauport.
Quebec Dept. of Roads.....	Quebec.....	
Quebec Harbour Commission.....	Quebec.....	Inner Basin.
Raymond, Laurent.....	140 Brooks St. Sherbrooke.....	
Robert, Pierre.....	Beauportville.....	
St. Louis, Nap.....	St. Ursule.....	
Saumure, Octave.....	Bouchette.....	Bouchette.
Sand Company, Ltd.....	10 Limoilou Ave., Quebec.....	St. Charles River.
Sherbrooke City.....	Sherbrooke City.....	Orford Tp.
Sorel Sand Co., Ltd.....	St. Joseph de Sorel.....	St. Lawrence River.
Standard Lime Co., Ltd.....	Joliette.....	St. Emelie.
Thibault, Maurice.....	Cap de la Madeleine.....	
Verret, Louis.....	Lake St. Charles.....	
Vezina, Edouard and Son.....	St. Joseph de Levis.....	
ONTARIO—		
Adair, Dolsan.....	R.R. 2, Caledon East.....	Caledon Tp.
Allan, Jas.....	Seaforth.....	Tuckersmith Tp.
Armstrong Supply Co., Ltd.....	1143 York St., Hamilton.....	Hamilton.
Oxford, J. B. and Sons.....	35 Elm St., St. Thomas.....	Yarmouth Tp.

Sand and Gravel—Continued

Name	Address	Location
ONTARIO—Continued		
Ashton, Thomas	1354 Queen St. E., Toronto	Scarboro.
Austin, N.B.	Box 48, Erin	Erin.
Backus Brooks Co.	1100 Builders' Exchange, Minneapolis, Minn.	Fort Francis.
Bast, Aaron	Bridgeport	Waterloo Tp.
Bellyou, N. E.	R.R. No. 4, Trenton	Murray Tp.
Benson and Patterson	Stamford	Stamford
Bissonnette, W. A.	Box 595, Smith's Falls	Montague Tp.
Brantford, City of	City Hall, Brantford	Brantford.
Boyd Bros.	Box 28, Osgoode	Osgoode Tp.
Burrows, John	447 Klock Ave., North Bay	Widdfield Tp.
Cameron, Chas. M.	R.R. No. 1, Glencoe	Middlesex Co.
Conlin, Herbert L.	156 Front Street East Toronto	Highland Creek.
Carroll Bros.	490 Ellicott Square, Buffalo	Sherkston.
Chisholm, W. G.	R.R. 3, Milton	Halton Tp.
Cudmore, Mrs. Bertha	R.R. 6, Thamesville	Howard Tp.
Cudmore, Mrs. Alice	R.R. 1, Hensall	Huron County.
Cuthbert, C. E.	Currier	Oxford West.
Dominion Concrete Co., Ltd.	Kemptville, Box 103	Gower Tp.
Donald, Andrew	R.R. 1, Ingersoll	Oxford County.
Dowler Bros.	Billings Bridge	Bowesville Rd.
Durham Stone and Sand Co., Ltd.	402 Harbour Bldg., Toronto	Durham.
Ellins Bros.	Postal Sta. "D", West Toronto	Etobicoke Tp.
Empire Limestone Co.	19 Hudson St., Buffalo	Sherkston.
File, Secord	43 Port St., Brantford	Lynden.
Foster, R. R.	278 Echo Drive, Ottawa	Nepean Tp.
Fraser, S. A.	R.R. 1, Arnprior	Arnprior.
Frid Bros.	Dundas Rd. and Macklin St., Hamilton	Hamilton.
Fuller Gravel Co., Ltd.	402 Harbour Bldg., Toronto	Fuller.
Goodreau, Chas.	R.R. 6, Thamesville	Chatham Tp.
Gregory Milton	Kirkton	Osborne Tp.
Grey Township—J. M. Bray	R.R. 2, Brussels	Grey Tp.
Harbour Brick Co., Ltd.	Fleet St., Toronto	
Higgs, Thos.	R.R. 7, London	
Hill, J. D.	R.R. 6, Woodstock	East Ionia.
Hinde Bros.	134 Northlands Ave., Mt. Dennis	Mt. Dennis.
Hopping, R. G.	226 High St., London	Manor Park.
Howard, N. H.	Aldershot	Flamboro Tp.
Hydro Electric Power Commission of Ontario	190 University Ave., Toronto	Hydro.
Jago Concrete Products Co.	Summerville	Toronto Tp.
Keyes, S. W.	Woodstock, R.R. 8	
Kilbourne, H. and Sons	145 Wharncliffe Rd., London	Westminster Tp.
Kingston Penitentiary	Portsmouth	Portsmouth.
Kingston Sand and Gravel Co., Ltd.	183 William St., Kingston	Kingston Tp.
Lawson, James	R.R. 2, Blyth	Morris Tp.
Leaside Brick and Sand Co.	Leaside	Leaside.
Le Viness, S.	R.R. 3, Niagara Falls	Stamford.
Lovelace, E. J.	St. Catharines	St. Catharines.
Lowe, G. G.	R.R. 1, Leonard	Cumberland Tp.
MacArthur, Kenneth	Ailsa Craig	Ailsa.
Maple Sand, Gravel and Brick Co.	454 King St. W., Toronto	Maple.
Moore, John	R.R. 1, Ailsa Craig	East William Tp.
Nagle, Jos.	Dublin	Hibbert Tp.
Northern Development Dept.	Parliament Bldgs., Toronto	
Ollman Bros.	111 Macklen St., Hamilton	Hamilton.
Ontario Dept. of Highways	Parliament Bldgs., Toronto	
Peterborough, City of	133 Simcoe St., Peterborough	Peterborough.
Panafond, A. E., Estate of	605 Talbot St., St. Thomas	Yarmouth Tp.
Quick, Chas. R.	101 Brisbane St., London	Manor Park.
Quigley's	317 Main St. E., Hamilton	Bartonville.
Ratcliffe, E. B., Ltd.	King St., Bartonville	Barton Tp.
Regan and Blackburn	1550 Dufferin St. Toronto	Mt. Dennis.
Robinson, Wm.	R.R. 1, Crediton	Crediton.
Sand and Supplies, Ltd.	74 University Ave., Toronto	Waterloo.
Sarjeant Co., Ltd.	51 Dunlop St., Barrie	Barrie.
Scheerer Conrad	R.R. 1, Stratford	Stratford.
Seebach, Ed.	R.R. 1, Sebringville	Ellie Tp.
Shirman and Hubbell	R.R. 5, Thamesville	Camden Tp.
Smythe, C., Ltd.	Colonial Bldg., Toronto	Etobicoke Tp.
Stevens, J. H.	Box 211, Stoney Creek	Stoney Creek.
Tack, Henry	Sub. I, London	London Tp.
Valley, Frank	Box 107, Belwood	W. Garafaxa.
Waterford Sand and Gravel Co., Ltd.	402 Harbour Bldg., Toronto	Waterford Co.
White Homer and Co.	Pictou	Hallowell Tp.
Wilks, George	26 Railway St., Woodstock	Woodstock Tp.
Wilson, M.	R.R. 1, Maple	Vaughan Tp.
Windsor Sand and Gravel Co., Ltd.	109 Ottawa St., Walkerville	Essex Co.
Wilcox, Hervey	985 Bridge St., Niagara Falls	Stamford Tp.
Wright and Co.	960 Queen St., Sault St. Marie	Dist. of Algoma.
York Sand and Gravel Co.	Toronto	York Co.

Sand and Gravel—Concluded

Name	Address	Location
MANITOBA—		
Buildings Products and Coal Co., Ltd.	Christie St., Winnipeg.	Woodland.
Brandon City	City Hall, Brandon.	Brandon.
Cumming and Dabbie	233—9th St., Brandon.	Brandon.
Cusson, J. A.	379 Desautels, St. Boniface.	St. Anne du Chêne.
Greater Winnipeg Water Dist.	Civic Offices, Winnipeg.	G. W. W. D. Railway.
Lake Bar Sand and Gravel Co.	Notre Dame East, Winnipeg.	Black Island Lake.
McCurdy Supply Co., Ltd.	136 Portage Ave. East.	Birds Hill.
Riley, W. J.	Molson.	Molson.
Sinnott, S. J.	St. Ouens.	St. Ouens.
Winnipeg City Hydro Electric	55 Princess St., Winnipeg.	Slave Falls.
SASKATCHEWAN—		
McKenzie Supply Co., Ltd.	Box 107 Regina.	Pilot Butte.
North Battleford City	North Battleford.	
Prince Albert City	City Hall Prince Albert.	Prince Albert.
Saskatchewan Highways	Regina.	
Weyburn Mental Hospital.	Box 1056, Weyburn.	Weyburn.
Weyburn Storage and Distributing Co.	Weyburn.	Weyburn.
ALBERTA—		
Alberta Highways	Edmonton.	
Cristall Sand.	10209—103 St., Edmonton.	Perryvale.
Foundation Co. of Canada, Ltd.	Examiner Bldg., Calgary.	Radnor.
Huff Gravel, Ltd.	708 Tegler Bldg., Edmonton.	Heatherdown.
Nanton Town	Nanton.	Nanton.
Spoke, J. C.	Perryvale.	Perryvale.
Sutherland, Moses	Olds.	Olds.
BRITISH COLUMBIA—		
British Columbia Highways	Victoria.	
Cascade Rock and Gravel Co., Ltd.	False Creek, Vancouver.	North Vancouver.
Columbia Bitulithie, Ltd.	Granville Island, Vancouver.	Vedder Dyke Road.
Consolidated Mining and Smelting Co., Ltd.	Tadanac.	Tadanac.
Deeks Sand and Gravel Co., Ltd.	101 West 1st Ave., Vancouver.	Seymour Creek.
Gilley Bros., Ltd.	902 Columbia St., New Westminster.	Fraser River.
Hillside Sand and Gravel, Ltd.	1075 Main St., Vancouver.	Howe Sound.
Johnston and Co., Ltd.	Box 250 Kamloops.	
Nelson, Corporation of City.	City Hall, Nelson.	Nelson.
Prince Rupert City of.	Prince Rupert.	Prince Rupert.
Producers Sand and Gravel Co., Ltd.	1902 Stone St., Victoria.	Esquimalt.
Swinerton, Musgrave and Wilson.	640 Fort St., Victoria.	Metchoosin.
Vancouver, City of.	City Hall, Vancouver.	Vancouver South.
Vancouver Island Power Co., Ltd.	1016 Langley St., Victoria.	Renfrew district.

Stone Quarrying Industry—Granite

NOVA SCOTIA—		
Bower, Andrew R.	Shelburne.	Shelburne—Doctor Cove.
Fairview Crushed Stone Co., Ltd.	Fairview.	Fairview.
Dept. of Highways.	Halifax.	Debert.
Hoyt, C. M.	Middleton.	Nictaux West.
Nova Scotia Stone Co., Ltd.	91 Hallis St., Halifax.	Lake William.
Rice, E. A. and O. A.	Lawrencetown.	Nictaux West.
Rice, W. D.	Middleton.	Nictaux West.
NEW BRUNSWICK—		
Granite Street Pavement Co., Ltd.	Hampstead.	Hampstead.
Grattan, H. M. and Sons, Ltd.	Wallace St., St. George.	Charlotte Co.
Meating, Epps Co., Ltd.	St. George.	Bayside.
Milne Coutts and Co., Ltd.	St. George.	St. George.
Mooney & Sons, Ltd.	112 Queen St., St. John.	Spoon Island.
O'Brien and Baldwin.	St. George.	St. George.
St. John City.	St. John.	Shamrock Grounds.
QUEBEC—		
Alcoa Power Co., Ltd.	Racine.	
Angers and Toel, Ltd.	229 Racine St., Chicoutimi.	Chicoutimi.
B. and R. Granite Quarry.	Beebe.	Stanstead Tp.
Baillargeon and Côté.	St. Jean.	St. Luc Co.
Beebe White Granite Co.	Beebe.	Beebe Junction.
Bernier August.	Robertval.	Robertval.
Bergeron, Joseph.	Shawinigan Falls.	Almaville.
Bérubé, Lucien and Son.	Brownburg.	Chatham Canton.
Black Granite Co.	105 Côte de la Montagne, Quebec.	St. Gédéon.
Brodies, Ltd.	1070 Bleury St., Montreal.	Iberville Co., Guenette, Granit-ville.
Brunet, Joseph.	663 Chemin Côte des Neiges, Montréal.	Chatham Co.
Chicoutimi, Town.	Chicoutimi.	St. Paul rang.
Cloutier Bros.	Beebe.	Beebe.
Delevoide and Goffin.	Chicoutimi.	St. Thomas, Rang.
Dumas, August.	Rivière à Pierre.	Canton Bois.

Stone Quarrying Industry—Granite—Concluded

Address	Address½	Location
QUEBEC—Concluded		
Dumas Art Co.....	Rivière à Pierre.....	Canton Bois.
Duncan, Wm.....	Beebe.....	Beebe.
Foundation Co. of Canada, Ltd.....	1538 Sherbrooke St. W., Montreal.....	Trinity Bay.
Frontenac Quarries, Ltd.....	St. Sebastien.....	Whitton, Stanhope.
Gauthier, Jos. and Sons.....	97 Taché St., Chicoutimi.....	Chicoutimi.
Grand Mère Town.....	City Hall, Grand'Mère.....	Ste. Flore.
Hazelton, Wm M.....	Beebe.....	Stanstead Tp.
Hove Hill Granite Co., Ltd.....	749 Marcell Ave., Montreal.....	Beebe.
Kennedy Construction Co.....	St. Louis du Ha! Ha!.....	Temiscouata.
Lacasse and Boulais.....	Beebe.....	Stanstead Tp.
Lavoie and Doyer.....	Rousseau Mill.....	Portneuf Co.
Marchessault, H. and Son.....	60 Ave. West End, Outremont.....	St. Jean Co.
McIntosh, Robert.....	Beebe.....	Stanstead Co.
Moneau, Polycarpe.....	Roberval.....	Roberval.
Perron, Arthur.....	Rivière à Pierre.....	Portneuf Co.
Perron, Stanislas.....	Rivière à Pierre.....	Canton Bois.
Plamondon, Granite Co., Ltd.....	33 Brewster, Sherbrooke.....	Wolfe Co.
Rigaud Granite Products, Ltd.....	132 rue St. Jacques, Montreal.....	Rigaud.
Riverin and Riverin Engr.....	39 Rue Montcalm, Chicoutimi.....	Moulin River.
Robertson and Janin Paving Co.....	1460 rue Sherbrooke W., Montreal.....	Rosemont.
Rockland Crushed Stone Co., Ltd.....	1465 Bleury St., Montreal.....	Outremont.
Scotstown Granite Co., Ltd.....	Scotstown.....	Tingwick.
Silver Granite Co., Ltd.....	117 Côte d'Abraham, Que.....	St. Samuel Sta.
Stanstead Granite Quarries, Co.....	Beebe.....	Graniteville.
Tremblay, Jos.....	Baie St. Paul.....	Charlevoix.
Voyer, F. and Frère.....	Rivière à Pierre.....	Rivière à Pierre.
Wilkinson, Frank.....	Beebe.....	Stanstead Co.
ONTARIO—		
Crystalite Stone Products, Ltd.....	59 Hillyard St., Hamilton.....	Bancroft.
Dominion Trap Rock Co., Ltd.....	470 St. Alexis St., Montreal.....	Bruce Mines.
J. T. Ferrill.....	Birds Creek.....	Brick Hill.
Fort William City.....	City Hall, Fort William.....	Fort William.
Gordon Granite Co.....	Confederation Life Bldg., Toronto.....	Gananoque.
Grenville Crushed Rock Co., Ltd.....	917 Keefer Bldg., Montreal.....	Hawk Lake.
Hakanson Swan.....	Gananoque.....	Gananoque.
Horne, Wm.....	Ashford Block, Winnipeg.....	Butler.
Hydro Electric Power Commission.....	190 University Ave., Toronto.....	Hydro.
McKee Bros.....	R.R. 3, Lansdowne.....	Leeds Co..
Ontario Rock Co., Ltd.....	1501 Canada Permanent Bldg., Toronto.....	Belmont Tp.
Peninsula Granite Quarries, Ltd.....	Peninsula.....	Peninsula.
Quinn Stone and Ore Co., Ltd.....	1500 Alworth Bldg., Duluth, Minn.....	Fort William.
Robertson and Mutchmore.....	Gananoque.....	Leeds Co
BRITISH COLUMBIA—		
B.C. Monumental Works, Ltd.....	199-8th Ave., E. Vancouver.....	Granite Island.
Cascade Rock and Gravel Co., Ltd.....	False Creek, Vancouver.....	Burrard Inlet.
Coast Quarries, Ltd.....	837 Hastings St. W., Vancouver.....	Burrard Inlet.
Gilley Bros.....	902 Columbia St. W., New West- minster.....	Cooquam.
Nelson Granite and Monument Co.....	Box 865, Nelson.....	Nelson.
Prince Rupert City.....	Prince Rupert.....	Prince Rupert.
Vancouver Granite Co., Ltd.....	543 Granville St., Vancouver.....	Nelson Island.
Vernon Granite and Marble Co.....	Okanagan Landing.....	Yale Dist.
Western Granite Co., Inc.....	1005 Lloyd Bldg., Seattle.....	Ymir.
Wilson, James S.....	Sirdar.....	Sirdar.

Stone Quarrying Industry—Limestone

NOVA SCOTIA—		
Eastern Lime Co., Ltd.....	Windsor.....	Windsor.
Foundation Co. of Canada, Ltd.....	Guy and Sherbrooke Sts., Montreal.....	Milton.
National Trust Co., Ltd.....	Sydney.....	Point Edward.
Ross and McLellan.....	Iron Rock.....	Pictou Co.
New Brunswick—		
Peters, C. H. and Sons, Ltd.....	71 Dock St., St. John.....	Torriburn.
QUEBEC—		
Bathurst Power and Paper Co., Ltd.....	Bathurst, N.B.....	Port Daniel, Que.
Beaudry, J. Piro.....	41 Rue Taché, Joliette.....	Joliette.
Belanger Cement Works, Ltd.....	4291 Delanaudière, Montreal.....	Rosemont.
Canada Cement Co., Ltd.....	Canada Cement Bldg., Montreal.....	Hull.
Canada Lime, Ltd.....	St. Marc des Carrières.....	St. Marc.
Charron, Arthur.....	Village Bélanger.....	Cap St. Martin.
Citadel Brick, Ltd.....	14 St. Joseph St., Quebec.....	Montmorency Co.
Cousineau, Alderic.....	5697 St. Urbain, Montreal.....	Montreal.
Delormier and Rogers Quarries, Ltd.....	4901 Iverville St., Montreal.....	Montreal.
De Sales Quarry, Ltd.....	10 St. Jacques W., Montreal.....	De Sales.
Desormeaux, E.....	Capt St. Martin.....	Cap St. Martin.
Deschambault Quarry Corp.....	52 Rue St. Paul, Quebec.....	Portneuf Co.

Stone Quarrying Industry—Limestone—Continued

Name	Address	Location
QUEBEC—Concluded		
Dominion Lime Co.....	East Angus, Montreal.....	Lime Ridge.
Dufresne Construction Co., Ltd.....	1832 Blvd. Pie IX, Montreal.....	Riv. des Prairies.
Duquette and Biron.....	Ville St. Michel.....	Ville St. Michel.
Dupré, Arthur.....	St. Michel.....	Laval Co.
Dupré Quarries, Ltd.....	411 Canada Cement Bldg., Montreal.....	St. Michel.
Durocher, Cyrille.....	11021 Norte Dame Est, Montreal.....	Montreal East.
Fuger and Smith.....	Pointe Claire.....	Pointe Claire.
Gagnon, Martin.....	7794 St. Andrew St., Montreal.....	
Gaspesian Fertilizer Co.....	Port Daniel East.....	Port Daniel East.
Gauthier, Olivier.....	St. Marc des Carrières.....	St. Marc.
Giffard, Quarry, Ltd.....	Giffard.....	Giffard.
Gingras and Bros., Ltd.....	St. Marc des Carrières.....	St. Marc.
Gravel, Ed. L.....	Chateau Richer.....	Chateau Richer.
Guilbault, Aldine and Fils.....	8851 St. Lawrence Blvd., Montreal.....	Terrebonne Rd.
Guilbault Frères and Co.....	St. Elizabeth.....	St. Elizabeth.
Harbour Commission, Montreal.....	Montreal.....	Montreal.
Kennedy Construction Co., Ltd.....	407 McGill St., Montreal.....	St. François de Sales, Acton Vale.
Lacoulaine, L.....	Chateau Richer.....	Chateau Richer.
Legace, Napoleon.....	12 Rue Mon Repos, L'Abord à Plouffe.....	Rang St. Martin.
Lapointe, Emile.....	St. Dominique.....	St. Dominique.
Lapointe, Joseph.....	12034 Lachapelle, Montreal.....	Cartierville.
Laval Quarry Co., Ltd.....	Cap St. Martin.....	Cap St. Martin.
Lecrenier, V.....	8369 St. Denis, Montreal.....	Cap St. Martin.
Leduc, Edouard.....	St. Joachim.....	
Levesque, Armand.....	Roberval.....	Roberval.
Lyall, P. and Sons Co., Ltd.....	701 Transportation Bldg., Montreal.....	
Maisonneuve Quarry Co., Ltd.....	4740 Iberville, Montreal.....	Rosemont.
Martineau and Fils, Ltd.....	515 Marie Anne Est, Montreal.....	Montreal.
McCarthy, W. A.....	104 St. John St., Quebec.....	Chateau Richer.
Miner, R. H., Ltd.....	7411 Delanaudière St., Montreal.....	St. Laurent.
Montreal Cottons, Ltd.....	Valleyfield.....	Valleyfield.
Neuville Quarry, Ltd.....	Neuville.....	Portneuf Co.
Noel, Oscar and Co.....	41 Leduc, Hull.....	Wrightville.
Pagé, Jos.....	Charlesbourg.....	Charlesbourg W.
Paquette, Lévis and Co.....	Cap St. Martin.....	Capt St. Martin.
Paquette, Damien.....	Village Bélanger.....	Cap St. Martin.
Quarries, Ltd.....	1253 McGill College Ave., Montreal.....	St. Vincent de Paul.
Roads Department, Quebec.....	Parliament Bldgs., Quebec.....	
St. Laurent Quarre, Ltd.....	Cap St. Martin.....	Cap St. Martin.
St. Louis, Quarry.....	St. Louis de Champlain.....	St. Louis de France.
St. Michel Quarry, Ltd.....	St. Michel de Laval.....	Montreal.
St. Vincent de Paul Penitentiaries.....	Dept. Justice, Ottawa.....	St. Vincent de Paul.
St. Viateur, Clercs.....	1145 Ave. St. Viateur, Outremont.....	Joliette.
Shawinigan Chemical, Ltd.....	83 Craig St. W., Montreal.....	Bedford.
Standard Lime Co., Ltd.....	Joliette.....	Joliette.
Stone and Quarry, Ltd.....	1340 Rue Bellechasse, Montreal.....	Montreal.
Tremblay, Nap.....	Hull.....	Hull.
Valleyfield, City.....	Valleyfield.....	Valleyfield.
Varin and Barbin, Ltd.....	St. Michel de Laval.....	St. Michel.
Verreault, Elz., Ltd.....	194 Rue du Pont, Que.....	Giffard.
Villeray Quarry Co., Ltd.....	4740 Iberville, Montreal.....	Montreal.
Wallace Sandstone Quarries, Ltd.....	132 St. James St., Montreal.....	Philipsburg.
West End Quarry, Ltd.....	Troye and Decelles Sts., Montreal.....	Montreal.
White Grit Co.....	Hurdman Rd., Ottawa.....	Portage du Fort.
Wright Builders Supply, Ltd.....	250 Catherine St., Ottawa.....	Hull.
ONTARIO—		
Beachville Lime and Stone Co.....	Paris.....	Oxford Tp.
Billie, Chas. V.....	510 Oxford Ave., Montreal.....	Meath.
Bolender Bros.....	Haliburton.....	Haliburton.
Bourgie, J. B.....	Embrun.....	Russell Co.
Brulé, E. D. and Sons, Ltd.....	Billings Bridge.....	Ottawa.
Brunner-Mond Canada, Ltd.....	501 Dominion Bank Bldg., Toronto.....	Anderdon Tp.
Canada Cement Co., Ltd.....	Canada Cement Bldg., Montreal.....	Belleville.
Canada Crushed Stone Corp., Ltd.....	76 Sun Life Bldg., Hamilton.....	Dundas.
Cartmell, Ellen, Estate.....	Box 383, Thorold.....	Thorold.
Cloutier and Grenon.....	Casselman.....	Limoges.
Code, W. Harry.....	26 Cornelia St., Smith Falls.....	Leeds Co.
Coldwater Crushed Stone, Ltd.....	Coldwater.....	Simcoe Co.
Dagg, J. G., Estate.....	Kleinburg.....	Kleinburg.
Dominion Stucco Co., Ltd.....	St. Boniface, Man.....	Silver Mountain.
Foster, R. R.....	278 Echo Drive, Ottawa.....	Ottawa.
Gordon Crushed Stone Co., Ltd.....	239 Confederation Life Bldg., Toronto.....	Hagersville.
Grenville Crushed Rock Co., Ltd.....	917 Keefer Bldg., Montreal.....	Oxford Mills.
Gypsum, Lime and Alabastine Co.....	Paris.....	Halton Co.
Hagersville Contracting Co., Ltd.....	Sun Life Bldg., Hamilton.....	Walpole Tp.
Henniger, M. G.....	Smith Falls.....	Carlton and Lanark.
Innerkip Quarries, Ltd.....	Innerkip.....	Oxford Co.
Irvine, Edgar Co., Ltd.....	Alexandria.....	Prescott Co.
Kingston Penitentiary.....	Portsmouth.....	Portsmouth.
Kirkfield Crushed Stone, Ltd.....	Fleet St., Toronto.....	Kirkfield.
Law Construction Co., Ltd.....	225 Sterling Road, Toronto.....	Grey Co.
Limestone Products, Ltd.....	Excelsior Life Bldg., Toronto.....	North Orillia.
Longford Crushed Stone, Ltd.....	Box 198, Orillia.....	Orillia.

Stone Quarrying Industry—Limestone—Concluded

Name	Address	Location
ONTARIO—Concluded		
McGinnis and O'Connor.....	Kingston.....	Barriefield.
McHay, Alex.....	1994—9th Ave. E., Owen Sound.....	Owen Sound.
McQuigge, J. R.....	Arnprior.....	Ramsay Tp.
Noranda Mines, Ltd.....	804 Royal Bank Bldg., Toronto.....	Haileybury.
Ontario Highway Dep't.....	Toronto.....	
Ontario Reformatory.....	Guelph.....	Wellington Co.
Orser, S. H.....	Sydenham.....	Sydenham.
Owen Sound City.....	City Hall, Owen Sound.....	Owen Sound.
Pembroke, Town of.....	Pembroke.....	Pembroke.
Pirson, John.....	Stevensville.....	Stanford Tp.
Puslinch Quarry, Ltd.....	Sun Life Bldg., Hamilton.....	Wellington Co.
Queenston Quarries, Ltd.....	Sun Life Bldg., Hamilton.....	Niagara Tp.
Quinton, W. G.....	Jasper.....	Jasper.
Robillard, H. and Son.....	195 Nicholas St., Ottawa.....	Gloucester Tp.
Routly, H. T.....	9 Richmond St. E., Toronto.....	Carleton-Stormont Cos.
Walker Bros.....	Box 586, Thorold.....	Welland Co.
Wallace, R. and Son.....	142 Patrick St., Kingston.....	Kingston.
Wehman, John.....	251 Division St., Kingston.....	Kingston.
Wentworth Quarries, Ltd.....	76 Sun Life Bldg., Hamilton.....	Saltfleet Tp.
Welland Ship Canal.....	Welland.....	
Willford, F. R. and Co., Ltd.....	Lindsay.....	Collingwood.
Windmill Point Crushed Stone Co.....	225 Sterling Rd., Toronto.....	Ridgeway.
MANITOBA—		
Gillis Quarries, Ltd.....	Spruce and Richard Ave., Winnipeg.....	Garson.
Moosehorn Lime Co., Ltd.....	214 Avenue Bldg., Winnipeg.....	Moosehorn.
Tyndall Quarry Co., Ltd.....	1591 Erin St., Winnipeg.....	Garson.
Western Stone Co., Ltd.....	Confederation Life Bldg., Winnipeg.....	Garson.
Winnipeg City.....	City Hall, Winnipeg.....	Stoney Mountain.
Winnipeg Supply and Fuel Co.....	214 Avenue Bldg., Winnipeg.....	Stonewall.
ALBERTA—		
Summit Lime Works.....	Box 273, Lethbridge.....	Lethbridge.
BRITISH COLUMBIA—		
Beale Limestone Quarries.....	Bella-Bella.....	Cunningham Island.
Pacific Lime Co., Ltd.....	744 Hastings St. W., Vancouver.....	Texada Island.
Powell River Co., Ltd.....	Powell River.....	Texada Island.
Priore and Vannucchi.....	Trail.....	Fife.
Rosebank Lime Co.....	744 Hastings St. W., Vancouver.....	Esquimalt.
Walleen, J. J.....	Port Alice.....	Quatsino Id.

Stone Quarrying Industry—Marble

NOVA SCOTIA—		
Brandram-Henderson, Ltd.....	Montreal.....	Whycocomagh.
QUEBEC—		
Brassard, Ovide.....	L'Annonciation.....	L'Annonciation.
Wallace Sandstone Quarries, Ltd.....	132 St. James St., Montreal.....	Philipsburg.
ONTARIO—		
Hodge and Son.....	Bancroft.....	Bancroft.
MANITOBA—		
Hudson Bay Marble and Granite Quarries, Ltd.....	The Pas.....	Hudson Bay Railway.
Manitoba Marble Quarries, Ltd.....	408 McArthur Bldg., Winnipeg.....	Cormorant.
BRITISH COLUMBIA—		
Canadian Marble and Granite Works, Ltd.....	10702—101st. St., Edmonton, Alta.....	Marblehead.

Stone Quarrying Industry—Sandstone

NOVA SCOTIA—		
Wallace Sandstone Quarries, Ltd.....	132 St. James St., Montreal.....	Wallace.
NEW BRUNSWICK—		
Miramichi Quarry Co.....	Quarryville.....	Quarryville.
QUEBEC—		
Blais, Jos. Engr.....	10 Ave. Mont Marie, Levis.....	St. Nicholas.
Bourbonnais, J. A.....	Vaudreuil Sta.....	Vaudreuil.
Canadian Rock Products, Ltd.....	2020 Union Ave., Montreal.....	Montmagny Co.
Faubert, Alphonse.....	Ville de Levy.....	Ville de Levy.
Gagnon, L. P.....	St. David.....	St. David.
Montmagny, Ville de.....	Montmagny.....	St. Thomas.
Northern Construction Co., Ltd.....	605 Confederation Bldg., Montreal.....	Victoria.
Sherbrooke City.....	Sherbrooke.....	Canton Ascot.
Vezina, Jos.....	St. Foy, Quebec.....	St. Foy.
ONTARIO—		
Credit Valley Quarries, Ltd.....	C.N.R. Florence St., Toronto 3.....	Glen William's.
ALBERTA—		
Oliver, Wm.....	1823—16th St. W., Calgary.....	Calgary.
BRITISH COLUMBIA—		
Cranbrook City.....	Cranbrook.....	Cranbrook.
McDonald, J. A. and C. H., Ltd.....	1571 Main St., Vancouver.....	Newcastle Island.

APPENDIX ONE

EXPLANATORY NOTES

Method of Computing Quantities and Values on the Mineral Production of Canada.

Antimony.—Recoverable metal in shipments made valued at the average New York price for fine metal.

Arsenic.—(a) Recoverable arsenic in concentrates exported at an arbitrary value; (b) white arsenic shipped from Canadian smelters at its sales value.

Bismuth.—(a) Recoverable metal in silver-lead-bismuth bullion shipped to foreign smelters for refining at an arbitrary value; (b) Bismuth metal produced at Canadian smelters valued at the average New York price for the year.

Cadmium.—Smelter production valued at the average New York price for the year.

Cobalt.—Cobalt content of the various cobalt products sold by Ontario smelters added to the cobalt content of ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

Copper.—(a) Recoverable copper in ores and concentrates exported added to the copper in blister copper made at Canadian smelters valued at the average New York price for electrolytic copper; (b) Copper in matte exported from Canadian smelters valued at an arbitrary rate agreed upon between the Dominion Bureau of Statistics and the Ontario Department of Mines.

Gold.—Gold in bullion produced and the recoverable gold in all other Canadian mine products valued at the standard rate of \$20.671834 per fine ounce.

Iron Ore.—Export tonnages at sales value.

Lead.—(a) Recoverable lead in ores exported from Canada added to lead contained in base bullion made at Trail, B.C., valued at the average London quotations for the year, the English quotations being converted to Canadian funds at par (\$4.86666). (b) Sales from the smelter of the Kingdon Mining, Smelting and Manufacturing Co., Ltd., Galetta, Ontario.

Molybdenite.—Shipments in terms of MoS_2 at their sales value.

Nickel.—(a) Refined and electrolytic nickel produced at Canadian refineries valued at the average price obtained for such products sold during the year; (b) Nickel in oxides and salts sold from Canadian smelters and refineries at its total selling value in the form in which it was sold; (c) Nickel in matte exported from Canada valued at an arbitrary figure agreed upon by the Ontario Department of Mines and the Dominion Bureau of Statistics (representative of the value of the nickel in matte).

Platinum group metals.—Recoverable metals in smelter products at their sales value to the producer and placer platinum at the average New York price for the year.

Silver.—Silver bullion produced and the recoverable silver in other smelter products, and the recoverable silver in Canadian ores exported, at the average New York price for the refined metal.

Zinc.—Refined zinc produced at Trail and the recoverable zinc in concentrates exported, valued at the average monthly price quoted in London, exchange conversion being made at par.

Coal.—Output tonnage evaluated *pro rata* according to income from sales.

Other Non-Metallic Minerals, Clay Products and Structural Materials.—Shipments during the year at their respective sales values.

Imports.—Statements of quantities and values are based on the declarations of importers, as subsequently checked by government officials.

The value of imported merchandise is the fair market value or the price thereof when sold for home consumption in the principal markets of the country whence and at the time when the same were exported directly to Canada. The *price* and *value* of the goods in every case are stated as in condition packed ready for shipment, the fair value being shown in the currency of the country of export, and the selling price to the purchaser in Canada shown in the actual currency in which the goods were purchased. In the case of goods that are the manufacture or produce of a foreign country, the currency of which is substantially depreciated, the value stated is the value that would be placed on similar goods manufactured or purchased in the United Kingdom and imported from that country, if such similar goods are made or produced there. If similar goods are not made or produced in the United Kingdom, the value stated is the value of similar goods made or produced in any European country, the currency of which is not substantially depreciated.

Exports.—Statements of quantities and values are based on the declaration of exporters as subsequently checked by government officials.

The value of exports of Canadian merchandise is the actual cost or the value at the time of exportation at the points in Canada whence originally shipped.

Weight.—Weight, where shown in imports and exports is the net weight of the goods, excluding the weight of the covers or receptacles, except in the cases of certain goods, as provided in the tariff.

The expression *ton* means 2,000 pounds, and *cwt.* 100 pounds, avoirdupois. Where other units of quantity are used, imperial standards apply.

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Iron and Steel and Their Products: Pig Iron and Ferro-Alloys—Steel and Rolled Products — Castings and Forgings — Boilers, Tanks and Engines — Agricultural Implements — Machinery — Automobiles—Auto Accessories—Bicycles—Railway Rolling Stock—Wire and Wire Goods—Sheet Metal Products—Hardware and Tools—Miscellaneous Iron and Steel Products, n.e.s.

Manufactures of Non-Ferrous Metals: Aluminium Products—Brass and Copper Products—Lead, Tin and Zinc Products—Jewellery and Silverware—Electrical Apparatus and Supplies—Miscellaneous Non-Ferrous Metal Products—Non-Ferrous Smelting and Refining.

Manufactures of Non-Metallic Minerals: Aerated Waters—Asbestos Products—Cement—Cement Products—Coke and Gas—Glass (blown, cut, ornamental, etc.) —Lime—Petroleum Products—Products from Domestic Clays—Products from Imported Clays—Salt—Sand—Lime Brick—Stone Dressing—Artificial Abrasives and Abrasive Products—Miscellaneous Non-Metallic Mineral Products, including (a) Artificial Graphite and Electrodes, (b) Gypsum Products, (c) Mica Products, (d) Magnesite Products, (e) Non-Metallic Mineral Products, n.e.s.

Chemicals and Allied Products: Coal Tar Distillation—Acids, Alkalies and Salts —Compressed Gases—Explosives, Ammunition, and Fireworks—Fertilizers—Medicinal and Pharmaceutical Preparations—Paints, Pigments and Varnishes—Soaps and Washing Compounds—Toilet Preparations—Inks—Adhesives,—Polishes and Dressings—Flavouring Extracts—Wood Distillates and Extracts—Miscellaneous Chemical Products, including (a) Baking Powder, (b) Boiler Compounds, (c) Plastics, (d) Insecticides, (e) Sweeping Compounds, (f) Disinfectants, (g) Matches (h) Dyes and Colours, (i) Chemical Products, n.e.s.

Annual Bulletins.—In addition to the foregoing printed reports, a series of bulletins is issued annually, each of which presents the principal statistics relative to production: (a) in a particular industry, e.g., Automobiles, Petroleum Products, etc., (b) in each of the four main groups of industries. These are published in mimeograph form from time to time during the year as the necessary material becomes available.

Monthly—

Production of Iron and Steel in Canada.

Coal and Coke Statistics for Canada.

Automobile Statistics for Canada.

SPECIAL REPORTS—

Report on the Consumption of Prepared Non-Metallic Minerals in Canada.

Report on the Consumption of Mine and Mill Materials in Canada.

Report on the Consumption of Coke in Canada.

Annual Summary Report on the Mineral Industry and the Manufacturing Industries Related Thereto.

The Fertilizer Trade in Canada, July 1, 1929-June 30, 1930.

SEE INSIDE FRONT COVER FOR PUBLICATIONS ON THE MINERAL INDUSTRY

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